Vol. 1, No. 10
October 1986

$1.50

# PACKET RADIO MAGAZINE

Dedicated to the Advancement of Packet Radio

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Brandon, FL 33511

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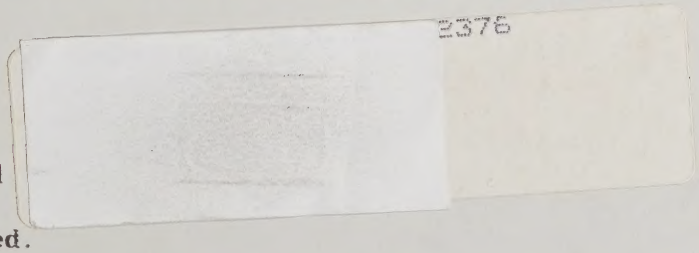


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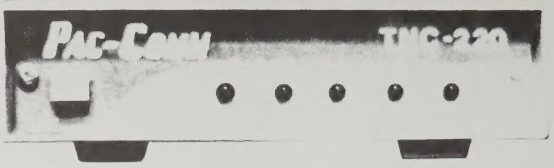

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# PACKET RADIO MAGAZINE

PACKET RADIO MAGAZINE is published monthly by the Florida Amateur Digital Communications Association, Inc., 812 Childers Loop, Brandon, FL 33511. (813) 689-3355. Printed in USA. FADCA is a non-profit Florida corporation dedicated to research, development, education, and public service through amateur digital communications activities.

Publisher and Editor: Gwyn Reedy, W1BEL
Assistant Editor: Brad Voss, KE8CW
Subscription Manager: Linda Reedy

**POSTMASTER**: Forwarding and return postage guaranteed/address correction requested. Please send form 3579 to 812 Childers Loop, Brandon, FL 33511.

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Subscriptions to PACKET RADIO MAGAZINE are available through any of the participating organizations listed below. See individual club pages in this issue for information on how to contact these organizations. If there is no participating group in your area, you are encouraged to join FADCA or TAPR. FADCA membership dues (US Dollars): United States = $15.00, Canada = $18.00, Foreign (airmail) = $25.00. Three dollars of each member's dues is allocated for FADCA operations, and the remainder is for the subscription to PRM. Major clubs wishing to participate in PRM should contact the FADCA office.

**PARTICIPATING ORGANIZATIONS**

*ALA-NET - Alabama Packet Radio Association*
*CAPRA - Chicago Area Packet Radio Association*
*FADCA - Florida Amateur Digital Communications Association*
*GRAPES - Georgia Radio Amateur Packet Enthusiasts Society*
*KCAPRG - Kansas City Area Packet Radio Group*
*LAPRS - Louisiana Amateur Packet Radio Society*
*MAPRC - Mid-Atlantic Packet Radio Council*
*MARDA - Mississippi Amateur Radio Digital Assn.*
*PPRS - Pacific Packet Radio Society*
*RMPRA - Rocky Mountain Packet Radio Association*
*TAPR - Tucson Amateur Packet Radio Corporation*
*UPRA - Utah Packet Radio Association*

Articles and photographs are solicited dealing with any aspect of digital communications. Both technical and operational topics are desired including new product announcements and equipment reviews.

## *NEWS AND VIEWS*

Gwyn Reedy, W1BEL

About 750 persons from all over the world have joined FADCA since 1983, and the 500 or so current members receive PRM as a membership benefit. Since PRM began in January 1986 (an outgrowth of the popular FADCA>BEACON newsletter) FADCA has offered other clubs the opportunity to participate in the magazine. The rules are very simple and informal.

1. Any club that wishes to participate in PRM merely needs to inform me by letter or telephone.

2.The participating club must send a list of members with their mailing addresses and a payment plan for the PRM subscriptions. Clubs are provided PRM for the fee of $10.00 per year per member, payable monthly. Many clubs have chosen to pay ahead for part or all of a year.

3.The clubs are responsible for maintaining their own records of members' addresses, dues payments, renewals, etc. By having the clubs do their own recordkeeping, FADCA can offer the magazine at a cost slightly below what it costs to service FADCA members. (One unexpected situation has been that FADCA's address list is usually more current than the participating clubs because the Post Office sends us copies of address updates.)

4. Clubs may choose to have a regular column in the magazine, or an occasional column, or none at all. Editorial material is nominally due to the FADCA address by the last Friday of the month for publication in the following month's issue. Since PRM has been running nearly a month late during most all of 1986, this deadline has been quite flexible. Our repeated efforts to get on a proper schedule will make adherence to that deadline more important in the future.

5. Each club must provide a point of contact to FADCA who is responsible for maintaining the affairs of the PRM relationship.

That is all there is to it. FADCA is providing a service to the packet movement by publishing a magazine with information from all over the nation and world. The participating clubs are able to receive a larger, broader-based magazine than most of them could produce alone, and at a very reasonable cost. Everyone has benefitted from the larger magazine size made possible by the cost savings of a larger circulation.

In the past, some persons were members of FADCA and another group. When that other group opted to receive PRM, the dual members received two copies of the magazine. FADCA will refund the remaining portion of any membership when a person is receiving multiple copies. To date, this refunding has never been requested! Most persons either continue getting the second copy and donate it to prospective members, or request deletion from the mailing list while continuing their FADCA membership.

Thank you all for making this magazine possible.

- PRM -

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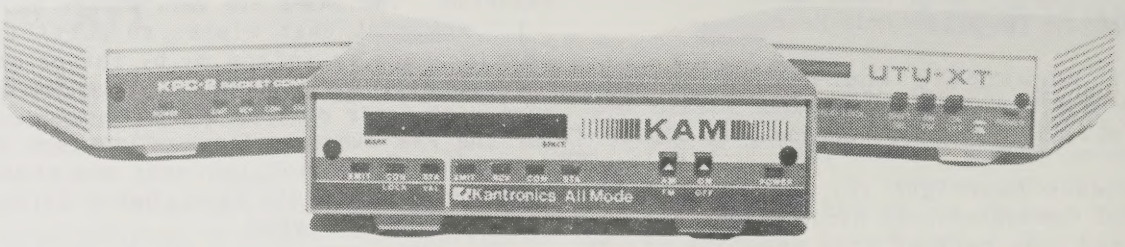
# K A M

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MARDA
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## *INTRODUCTION TO MAPRC*

Tom Clark, W3IWI

A lot of people have been asking questions about packet organizations in the mid-Atlantic area, so let me try to answer them at one time.

1. Do we have any local packet radio clubs?
2. What is MAPRC anyway?
3. Why should I join MAPRC?
4. How do I join MAPRC?
5. When does MAPRC meet? Are there any local meetings?

In this area (and I include MD, DC, NoVA, DE, SNJ, WVA and PA in my definition of the "area" -- more on this later) we DO have an organization that is supposed to support and coordinate packet radio activities, and it is called MAPRC -- the Mid-Atlantic Packet Radio Council.

In the fall of 1984, at about the time that BBSs in the Balto/Wash, SNJ/ Philly and Harrisburg areas were creating an ad-hoc network by making use of their newly acquired ability to forward mail between the local areas (and when the local packet population was about 10% of what it is now), we began to see the need to establish some scheme to coordinate activities.

Shortly after Thanksgiving and again in January 1985, we agreed to meet at a point equidistant (some say mutually inconvenient) from the three areas; the chosen venue was the northern-most rest-stop in MD near Elkton (and near the Elk Neck location of WB4APR-6 which needed some work at the time -- what else is new?).

Early topics discussed by the collected group included the need for additional linking sites, coordination of BBS proceedures, recommendations for good operating practices, the need for a more formal organization, and the problem we saw developing with area repeater councils. This latter item concerned the fact that conventional repeater wisdom was unable to cope with simplex activity where multiple users could share a frequency; we simply didn't fit their normal coordination mold.

We decided that our needs would be served best by having the repeater councils assign a block of frequencies for packet activities, and then letting the packeteers worry about the details. During these meetings we also decided on the MAPRC name and decided our "turf" was a circle of about 100 miles centered on Elkton, which included all the major area activity at that time and included the entire states of MD and DE, Southern NJ, Southeastern PA, and Northern VA.

In the spring of 1985 we sponsored a well-attended packet radio meeting at the Trenton Computerfest, and then met at the rest-stop again in May. At that time I presented a "battle plan" which has been widely circulated (on the W3IWI BBS it is available for review as the file MAPRC/MAPRC.PLN). This outlined the conflict between network and individual users, the role of file servers/gateways/BBSs, and the need for the rapidly increasing user base to help augment the existing resources.

During this same period, the Balto/Wash - Philly - Harrisburg corridor became one of the busiest packet radio areas in the world. The BBSs were serving many hundreds of users; the W3IWI BBS alone was already handling nearly as many messages as the entire ARRL National Traffic System. The Kantronics KPC and TAPR TNC2 became available and the users continued to increase, doubling every 4-5 months.

In September (in the Balto/Wash area), November (at Elkton), January (Harrisburg) and March (Elkton) we again met, and finally got MAPRC incorporated, established officers and a Board of Directors and started collecting dues. Because of common needs, the packet groups from Pittsburgh, Williamsport, Scranton and Wilkes Barre in PA asked to be included and our "turf" expanded (along with the difficulty of holding real in-person meetings).

In discussing our goals for the large organization, it became obvious that MAPRC should help coordinate all LAN activities within its area. Thus MAPRC should worry about the assignment of frequencies for LANs. It should coordinate the technical and operating practices for the different LANs within its "turf". It should establish the standards for interlinking of LANs. It should interface with non-packet coordination bodies (i.e. repeater councils) to make certain that packet radio's unique requirements were being honored. And it should serve to help educate packet users.

There was also identified a clear need for new resources to handle the long-haul linking functions; we always cite the fact that WB4APR-6 serves virtually no local users but exists only as the relay "hub" for the original three geographical areas. If additional capabilities (more reliable hardware, higher baud rate channels, use of new frequencies, redundancy etc) are needed at a site like APR-6, then they should be sponsored by the overall MAPRC organization. This was contrasted to a LAN-oriented digipeater or node controller that serves only local users which is clearly the responsibility of the locals who benefit from these resources.

MAPRC is incorporated as a non-profit Scientific and Educational organization. It accepts dues from both individuals and clubs. The members elect a Board of Directors who establish general and elect MAPRC's officers. *More >>*

# CAPRA Chicago Area Packet Radio Association

## CAPRA MEETING SUMMARY

Gary Kaatz, W9TD, President

At the September 13 meeting of CAPRA, it was reported that the TCP/IP code obtained from Phil Karn is now functional in that a loopback test program was successfully run. The TELNET feature also appears to work. John Wilk, N9ATM, has volunteered to build the wire-wrap prototype of the Multibus, dual-channel HDLC board with DMA for our network controller. Money was allocated to upgrade the three 68000 single-board computers, each to be used in a network controller, to 512k of RAM. It was also reported that the voice net was running about 6 to 10 check-ins having questions about packet radio. Other reports were that the TNC at the N9ATM-2 digipeater was to be replaced with a dual-port digipeater. The two ports will be: 144.95 MHz, 1200 baud as is presently the case and 221.02 MHz, 9600 baud. The Dupage county ARES group is going to put up a 145.07 MHz digipeater for emergency use.

Nominations were opened for the annual elections. One nomination each was made for the offices of treasurer, secretary and the one director's position that is up for election. Nominations for the offices of president and vice president must be made before elections are held at the November meeting. CAPRA will have a booth at the Radio EXPO hamfest on September 27 and 28 at the Lake County Fairgrounds.

The program was a video tape: "2400 BPS Packet from Kantronics". Viewing was followed by discussion on the merits of 2400 baud.

### *CAPRA DATA*

Meetings: Held at the Glenside Public Library, 25 E. Fullerton Ave., Glendale Heights, on the second Saturday of every odd-numbered month, at 2 PM.

Membership: CAPRA dues are $20 for full membership and $10 for associate membership. Associate membership is intended for people who will not be taking advantage of the facilities and services provided by CAPRA, other than the newsletter and meetings.

PBBS: The primary PBBS station is WB9MJN who may be reached on 144.95 MHz direct or via the CAPRA digipeater, N9ATM-2.

Voice Net: A question and answer net is held on Wednesday evenings at 9 PM, on the 146.16/146.76 repeater, courtesy of the Chicago FM Club.

Newsletter Material: This may be sent to the address listed below. The deadline is the first day of each even-numbered month.

Address:
CAPRA, P.O. Box 8251, Rolling Meadows, IL 60008

- PRM -

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*MAPRC - continued.*

The current Board members are: N3CVL, K3RLI, AK3P, WB2MNF, WB6RQN, WB4APR and W3IWI. The officers selected at the 3/16 meeting are: W3IWI=President, WB6RQN=Vice President Engineering, WB2MNF=Vice President Operations, WA6YBT=Secretary and KC2TN=Treasurer.

A hot topic of discussion amongst the organizers was publications; we decided that "hot news" about packet radio activities could best be disseminated by packet radio [which is to say that nobody wanted to get involved with the hassles of mailing a lot of paper!]. At about the same time, the Florida Amateur Digital Communications Assn. agreed to convert their FADCA>BEACON newsletter (edited by W1BEL) into a publication called PACKET RADIO MAGAZINE that could serve all local packet radio groups; we accepted their offer and now all paid-up MAPRC members receive PRM.

To become a paid-up individual member of MAPRC, the dues are $18/year and can be sent to our treasurer:

Joe Fisher, KC2TN
33 Oakwood Ln
Atco, NJ 08004

In many of the local areas within MAPRC local meetings are held. For example in the Balto/Wash area every Saturday the AMRAD folks meet for pizza in Vienna VA, and about once a month the MD folks meet for pizza in Laurel. Watch your local BBSs for details in your area.

Hope this answers your questions. We want you to participate in MAPRC and help make packet radio become all that it could be.

- PRM -

## KISS TNC PROGRESS

Phil Karn, KA9Q

I'm happy to report that K3MC has finished his "alpha" version of the "KISS TNC" code for the TNC-2, and several of us are now running it. Mike's work consists of two parts: a ROM bootstrap loader that replaces the standard EPROM in the TNC-2, and the actual TNC code which you download across the serial interface as an Intel Hex format file. This version includes the ability to specify the transmitter keyup time and persistence variables through special control packets from the host.

I have added support for the KISS TNC to my TCP/IP code on the PC, and am now able to send and receive IP datagrams in UI (connectionless) AX.25 frames.

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# PPRS

**PACIFIC PACKET RADIO SOCIETY**

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## PPRS HAPPENINGS

Walter E Miller, AJ6T
PPRS President

The California automatic VHF network of linked W0RLI-style BBS continues to expand. Automatic forwarding now extends into Arizona and Utah, with additional links probably in operation by the time this is published. Most of the forwarding is on 145.01 Mhz, with the unfortunate result that this WESTNET frequency has been largely taken over by the BBS.

This overcrowding problem could be alleviated with level three networking, or by moving all the BBS off to another frequency (perhaps a 9600 baud 220 network). Neither of these solutions is likely to happen overnight, but in the meantime there are measures the sysops and users could take to make the channel more useable. A lot of auto-forwarding still occurs during prime time evening hours when most users are home from work. Many sysops have moved their forwarding times to the early morning hours (midnight to 5 am), and I hope that trend continues. The users must appreciate the fact that this auto-forwarding network practically forces the LAN concept upon us. A LOCAL area network based around each BBS implies that individual stations should only pick up and send mail via the nearest BBS. Your "home BBS" should be the one you can reach with the minimum number of digipeater hops (ideally via a direct connection without any digis). There is no excuse whatever for BBS DXing now!

K6IYK is compiling a Pacific and Southwestern Division Packet Directory. This is a good place to list your home BBS so that everyone on the network knows how to forward mail to you. Registration forms can be found on most of the California BBS. Reply to K6IYK via Compuserve (76576,507) or leave mail at either WB6YMH-2, WB6AIE or W6IXU.

Since 145.01 is so overloaded now, users should always try to move their local ragchews off to other frequencies. Why tie up .01 if you could just as well be on .03 or .05? There are lots of underutilized digis on those channels in Northern California. If you insist on packet DXing, try 145.05; there is a good digipeater link between SF and LA on that channel. Of course you have already cut out your beacons and throttled your retry count to a reasonable number (maybe 5), havn't you?

AI8A (Jim Tittsler, PPRS VP) has moved his level three digipeater, AI8A-3, to a better location in the San Jose foothills. This network switch on 145.07 runs N2WX EPROMS in an MFJ TNC2 clone, and can provide node-to-node ACKS over a virtual circuit. AI8A-3 can see N6IJP-1 scanning digipeater in the North Bay. Jim gave a very interesting and convincing demo of this level three switch at the last PPRS general meeting.

At the last PPRS meeting there was some discussion of expansion to the "mirror image" channels below 145 Mhz (144.91,93,95,97 and 99). A suggestion was made that one channel be reserved for 2400 baud operation, and that BBS be prohibited from some channel(s). What do you think? If we get and use these new frequencies, a little more band planning might help avoid the fiasco we have on 145.01-09.

The U.S. Congress finally passed the Electronic Communication Privacy Act. The President almost certainly will sign it into law. This bill will make just listening to certain parts of the radio spectrum illegal. You will be liable for a $500 fine for listening to cellular radio. Although this new law probably does not have a direct impact on amateur operation, everyone should be concerned about its un-American overtones.

In other Washington news, the FCC has acted on PR Docket 85-105 (the automatic control rule change). Part 97 has been amended to permit automatic retransmission of third party traffic by intermediate stations in a digital network. The new rules apply only for VHF operation using AX.25. The controversy of HF automatic operation has not been addressed in this action. In a separate action, the FCC has turned down the request for a public packet network which was to have used part of the amateur 6 meter band; however, the FCC suggested that our shared 902 Mhz band might be an appropriate place for such a service, so this issue is far from dead.

W0RLI, Hank Oredson, has moved to the Bay Area. He wrote the software for the RLI autoforwarding BBS. Hank has set up W0RLI BBS on 145.09 and plans to expand to a 4 port machine (using a pair of 820s) with two 2m ports and ports on 220 and HF. Welcome to California Hank.

AJ6T gave a packet talk and demo at Pacificon '86, the ARRL Pacific Division Convention in San Jose. The live demo featured an Electrohome EDP58XL Data Projector Monitor which generated a 10 foot display for easy viewing by the crowd. The follow-up packet Q&A session hosted by AJ6T, AI8A, WB6RAL and WB6ASR was also very well attended.

KG6EK, Jim Ericson, will be the guest speaker at the November 4th PPRS general meeting. Jim will describe his LOWFER station, which operates on 184.02 KHz. Unlicensed LOWFER operation is authorized between 160-190 KHz by the FCC. Stations are limited to 1 watt input and 50 foot antennas. LOWFERS who are also hams get together on Thursday evenings on 1987.5 KHz and Sunday mornings at 8 am on 3927 KHz. This should be a very interesting talk.

Nominations for 1987 PPRS officers are now open. Elections will held at the December meeting. Contact AJ6T if you are interested in serving on the PPRS Board of Directors.

*Continued on page 22.*

**UPRA CONNECT**
*Newsletter of the Utah Packet Radio Association*

## LINK'S UP!

Dave Pedersen, N7BHC

The big news from the Rocky Mountains this month is the progress in linking to surrounding areas.

During the last few months, several groups of dedicated packeteers have been working feverishly to install links radiating outwards from Salt Lake City before the snows came. Their efforts have culminated in links to Denver, Boise, and just about all of Southeastern Idaho. Refer to the map and article by N7HPR to graphically see how things look in the West these days.

The first big stride came several months ago with the installation of the Snowbird digipeater. This unit is installed at 11,000 feet, at the top of a ski resort of the same name, just East of Salt Lake City. It goes by the call of KD7YK-2, and essentially talks in three different directions; South to WA7GTU-2, towards California; Southeast to Ford Ridge, on the way to Colorado; and Northwest towards Boise.

The linking within Western Colorado has been in place for some time already, requiring only the completion of the Utah portion of the path. This was accomplished with two digipeaters. The first when heading away from Salt Lake City is at Ford Ridge, near Soldier Summit on the road between Provo and Price. This machine goes by the call of KD7YG-1, alias FORD.

The next part of the link is not really in Utah, but just over the border into Colorado. This is WB7WAB-1, alias BLU, located on Blue Mountain, just East of Vernal, Utah. This repeater can work into W0RRZ-1 at Grand Junction, and K0GUZ-1 at Sunlight Peak.

From Sunlight Peak, head East to N0BRI-1 at Kremmeling, then direct to K0ZCO in Boulder or W0HJX in Greeley.

Turning now towards Boise, we once again leap off from KD7YK-2 at Snowbird to Mount Harrison, South of Burley, Idaho. This digipeater has been planned for quite a while, and is most welcome. It goes by the call of WA7UHW-1, and has a vast coverage area. If you glance at a topographical map of Sothern Idaho, you will see that a very large portion of the area can work this digi. Well equipped stations in Salt Lake and Boise can work it directly, giving a point-to-point range of 300 miles with one digi.

The next hop from Mount Harrison is to W7SC, located on a ridge just Southwest of Boise. This digi provides the primary VHF packet path out of the valley in which Boise is located. Continuing on to the Northwest from Boise will prove difficult due to the rugged terrain and vast distances to be covered. Discussion are already beginning to this effect, and we may see the path swing more directly West across Southern Oregon.

The Cache Valley area of Utah is linked into Salt Lake City via N7CEU on the West side of Salt Lake being linked into WA7MXZ-1. This digi in turn easily works N7XS-1 in Pocatello, Idaho, which in turn links into K7ENE-1 in Idaho Falls. When combined with the coverage of the Mount Harrison digi, access into the network is extended to cover most of Southern Idaho.

Now that links have been established over several major paths, we need to improve them somewhat. Snowbird is to get a better antenna soon, which should drastically improve its coverage. The same goes for Blue Mountain, and the Boise digipeater.

Where to next? Well, if the folk in New Mexico put up the planned digi om Mount Nelson, the addition of one digipeater in Southeastern Utah should provide a link between Salt Lake and Albuquerque should be possible. That would provide the good stations in Boise with an 800 mile path with four digipeaters. Towers that are above 11,000 ASL sure are nice. Besides a few more links, we must work towards high speed networking, as the current system of 1200 baud digis is very marginal. In the meantime, if we could just get all the local traffic off 145.01, leaving it free for long haul mail forwarding...

- PRM -

### UPRA DATA

MEETINGS: Held at the Heathkit Store, at 7200 South State (58E.), on the second Thursday evening of the month at 7.30 p.m.

VOICE NET: The information dissemination and question/answer net is held on Tuesday evenings at 8.45 p.m. , on the 146.02/62 repeater. Net control is Steve N7HPR.

PBBS: The primary PBBS station for the Salt Lake City area is WA7UZO, running the WA7MBL BBS systems with an IBM XT clone. Operation is on 145.01 MHz.

MEMBERSHIP: UPRA membership dues are $15 annually. Additional family members sharing a newsletter pay only $1.00.

NEWSLETTER MATERIAL: This may be sent to the address listed below, or via several electronic routes, which are either ASCII text files on IBM formatted disks or via a BBS. Contact me via the phone number below for more information. Submission deadline is slowly creeping earlier each month...call for more info.

ADDRESS: For all UPRA business:
Utah Packet Radio Association
4382 Cherryview Drive
West Valley City, Utah 84120
(801) 967-5896

- PRM -

## *THE BIG PICTURE*

Steven Bible, N7HPR

I am pleased to present the Western United States Digipeater map. I would like to first acknowledge the use of the information provided by Rick Bates, WA6NHC, in his PATHFINDER (c) series, for information on the location of digipeaters in Washington, Oregon, California and Arizona. I would also like to thank Dave Felgar, NJ7A, and Dave Pedersen, N7BHC, for their encouragement and assistance.

As you can see, I do not have any information for Montana, Wyoming and New Mexico. If anyone can provide me with any information on digipeaters in these areas, I would greatly appreciate it.

The map was created on an Apple Macintosh computer, using MacPaint and MacDraw, and printed on a LaserWriter. This method leads itself to a professional look and ease of correcting or adding new digipeaters.

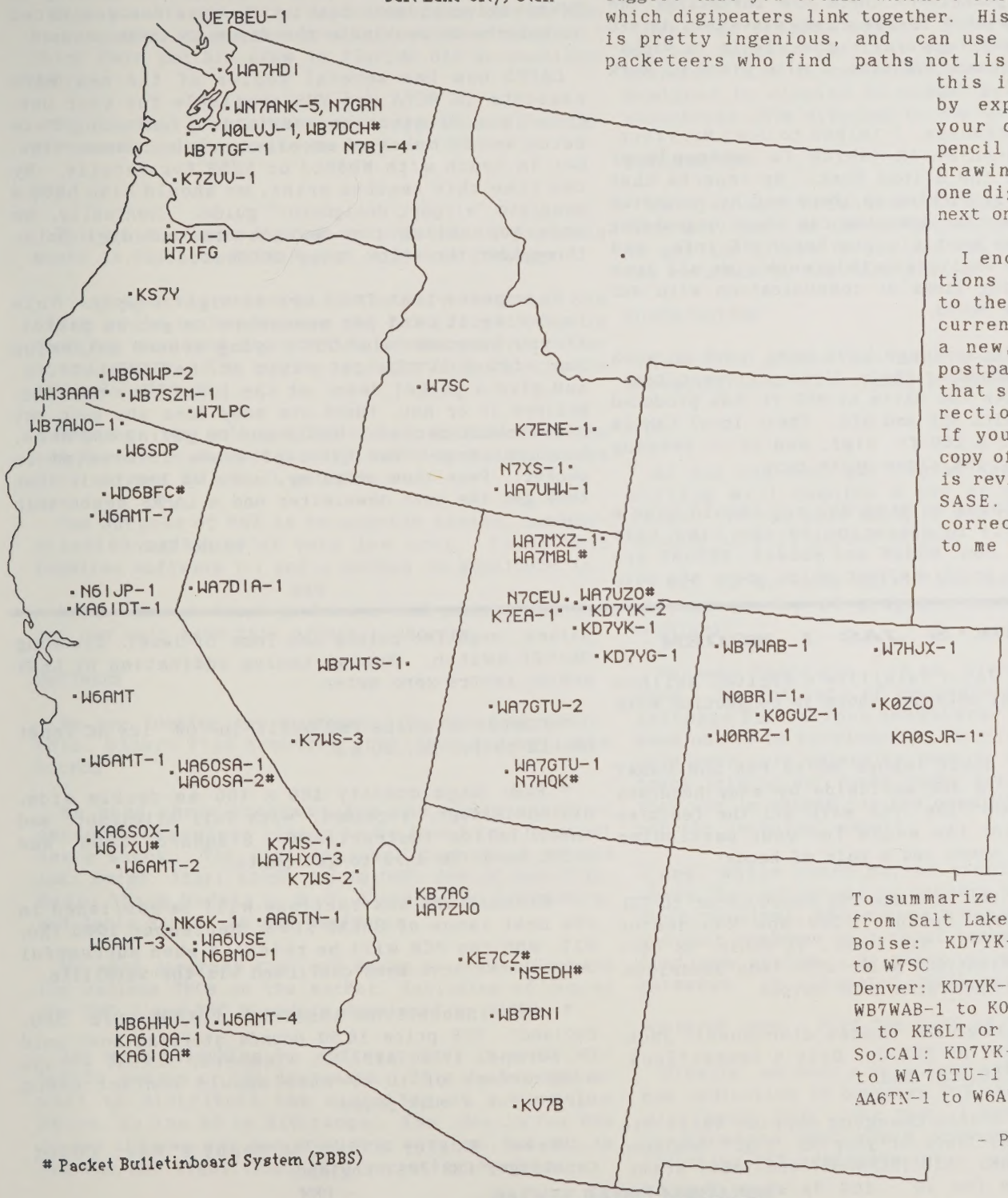
It is my hope that the Map gives a visual representation of the location of digipeaters in the Western United States. Whether you will be travelling or just learning where the digipeaters in your area are, I hope that this map comes in handy. I suggest that you obtain WA6NHC's PATHFINDER to find which digipeaters link together. His linking matrix is pretty ingenious, and can use the support of packeteers who find paths not listed on it. From this information, or by experimenting on your own, you can pencil in the paths by drawing lines from one digipeater to the next on the Map.

I encourage corrections and additions to the Map to keep it current. I will send a new, revised map, postpaid, to anyone that sends me a correction or addition. If you desire a new copy of the map as it is revised, send me an SASE. Please mail corrections additions to me at:

StevenBible,
N7HPR
1010Sterling
Drive
Salt Lake City,
UT 84116

## Western United States Digipeater Map
## 145.010 MHz

by N7HPR
Salt Lake City, Utah




# Packet Bulletinboard System (PBBS)

To summarize the main paths from Salt Lake City:
Boise: KD7YK-2 to WA7UHW-1 to W7SC
Denver: KD7YK-2 to KD7YG-1 to WB7WAB-1 to K0GUZ-1 to N0BRI-1 to KE6LT or W0ZCO.
So.Cal: KD7YK-2 to WA7GTU-2 to WA7GTU-1 to K7WS-1 to AA6TN-1 to W6AMT-1

- PRM -

The Official Newsletter of the
LOUISIANA AMATEUR PACKET RADIO SOCIETY

## LAPRS COLUMN

Packet radio in the Bayou State seems to be like the weather - blowin' and goin' here and dead calm there, but hardly what I'd call predictable. Take the town of Bastrop, tucked away in the Northeast corner of the state. Pat, N5BSL, reports that a small group of packeteers there are installing the BQP digipeater with a DB-224 at an elevation of 420 feet. This should give us a good tie-in to Vicksburg, MS and southern Arkansas. A nice piece of work for such a small group!

Speaking of Arkansas, I talked to Joel Harrison, WB5IGF, of Judsonia, AR (which is northeast of Little Rock) at the Biloxi fest. He reports that packet activity is picking up there and he requested info on LAPRS so that Arkansas can start organizing statewide. I've sent him one batch of info, and another will be on its way this week. We all look forward to opening lines of communication with our neighbors to the North.

The gang in Baton Rouge have been hard at work improving and expanding their digis. Current testing on a digi with 100 Watts at 800 ft. has produced solid connects with SLI and BIX. Their local LAN is on 145.09 MHZ on a 200 ft. digi, and it is keeping the RBBS's 20 Meg IBM clone quite busy.

Hammond continues to progress and should have a 100 ft digi (HMU) in operation by the time this reaches print. Don, W1IDK and Robert, KB5AAK are the prime movers in this effort which opens the path into McComb, MS. Guy, WD5GIV, reports that the digi in Alexandria is working well and that packet activity is picking up in the central part of the state.

Danny, K5ARH, reports that packet activity has been dropping off in Lafayette. Harry, WB5BZE, says that there is little increase in New Orleans. Perhaps these areas have passed through the novelty or fascination phase. Now is the time for dedicated packeteers to re-kindle the fires in these areas.

LAPRS now has several copies of the new TAPR cassette in BETA and VHS available for your use. This is a 30 minute presentation featuring Pete Eaton and it makes an excellent club presentation. Get in touch with WD5ELJ or NE5S for details. By the time this reaches print, we should also have a complete "airport designator" guide. Eventually, we hope to publish the designators and digi paths throughout the state...stay connected!

It appears that TNC's are in tight supply. This is making it hard for newcomers to get on packet. If you have an "old" TNC laying around gathering dust, brush it off, get a copy of the TAPR casette, and give a packet demo at the local club meeting. Believe it or not, there are many Hams who have not heard about packet. While you're giving the demo, be sure to get the QTH's of those interested in packet. Pass them on to me, and I'll see to it that they get the next newsletter and a LAPRS membership form.

`73 de NE5S

- PRM -

## AMSAT-UK'S JAS-1 MODEM

To use the new JAS-1 satellite's digital Mailbox you need a special external modem in conjuction with your AX.25 TNC.

Designed by G3RUH (whose AO-10 PSK and UOSAT demodulators are in use worldwide by many hundreds of stations) here's the PCB with all the features you need to tailor the modem for your particular station - and it saves you a pair of hands!

* MODEM: Downlink; RX audio PSK demodulator to TTL digital, 1200 bps. Uplink; 1200 bps Manchester encoding modulator to Mic level, TX audio. RX carrier LOCK LED indication. Selectable loop bandwidth. Morse code (CW) regenerated tone output.

* CONNECTs to AX.25 TNC "modem disconnect" jack. Suitable for TNC-1 or TNC-2. Only 4 connections: TXData, RXdata, TXclock, Gnd.

* DIGITAL AFC: tracks changing doppler shift via the Up/Down signal lines of your RX rig. Designed for all known ICOM, TRIO (KENWOOD) and YAESU standards, Adjustable for 10 - 100 Hz/step. Positive pulses, negative pulses and Icom bi-level. Tracking ON/OFF switch. Manual tuning indication by LEDs and/or centre-zero meter.

* POWER: AC mains PSU built-in OR 12v AC input OR 12 to 14v DC, 20 ma.

* PCB: High quality 160 x 100 mm double side, plated through, legended, with full alignment and installation instructions. Standard CMOS and LSTTL used. No hard-to-get parts.

* Circuit and instructions will be published in the next issue of OSCAR NEWS, September 1986 (No. 61), and the PCB will be released when successful loop checks have been confirmed via the Satellite.

* Obtainable from AMSAT-UK, LONDON E12 5EQ, England. PCB price 16.50 pounds sterling post paid UK/Europe, 17.50 airmail elswhere. AMSAT groups with orders of 10 or more should contact G3RUH direct for a bulk price:

James Miller G3RUH, 3 Benny's Way, COTON, Cambridge, CB3 7PS, England.

- PRM -

# Packet Status Register

Number 22

Tucson Amateur Packet Radio Corporation


## PRESIDENT'S CORNER

Lyle Johnson, WA7GXD

Hope you all liked the September issue of PSR/PRM! As you know, it was our premier combined issue. I think Gwyn and his crew in Florida did an excellent job!

Of course, if you have any suggestions for improvements, please write to Gwyn or TAPR.

PSX

The major topic I want to present to you this month is PSX, the TAPR Packet Software Exchange.

I erroneously reported in the July PSRQ that Tom Clark would be heading up the PSX effort. Tom in fact had declined due to time pressures from other commitments. The error in reporting this rests squarely with me.

However, the poll results show a mandate from the memebrship to establish a software exchange, so we will attempt to get it going!

The purpose of PSX is to provide tested, packet-oriented software at very low cost. To do this requires software (!) and a method to duplicate it.

Let's look at these problems, and perhaps see how you can help make this effort a success.

SOFTWARE

We are looking for programs like terminal emulators, binary file transfer utilities and bulletin boards.

We need these programs for the whole gamut of personal computers likely to be found in a typical ham's shack. The list includes Commodore 64 and 128; Amiga; Atari 520ST and 1040ST; IBM PC and PCjr; Radio Shack Models 1, 2, 3, 4 and Color Computers; and Apple 2, 2c, 2e and MacIntosh.

We want programs that are known to work well with the various TNCs on the market, including of course the TNC 1 and TNC 2 models developed by TAPR.

And we are looking for software that is either (1) public domain or (2) shareware. This is because we want to distribute the diskettes at a very low price, in the $5 to $10 range. The idea is for PSX to pay its own way and provide a service, but not to provide any significant TAPR operating revenues.

We need folks with the above-mentioned computers to act as testers for the software. The documentation must be verified. The interface to the TNC must be tested.

Does the program crash? Does it conflict with various accessories that may be installed in the computer? Can it handle various displays? If it is designed to display in color, is it useable with monochrome CRTs attached to the color display port?

DUPLICATION

We also need volunteers to duplicate the disks. TAPR will provide the diskettes and pay the postage to get the blanks to you and the duplicated diskettes returned to the TAPR office.

DISTRIBUTION

The TAPR office can handle all the details of accepting orders, shipping programs, etc.

ETC.

As you can see, getting an operation like this rolling will require a lot of effort from many folks. It can only work if you really want it to, because it will depend on you!

"Why do we need this?" you ask. "Aren't there already plenty of programs out there for these machines?"

Perhaps there are. If so, please help us locate them. We get lots of requests at the office for software for various computers. Computer dealers seem not to be knowledgable about modem programs, or only have very expensive ones to sell. Many packeteers joining our ranks today are computer novices; they are in packet for the communications potential, not the technical aspect.

And, while there may be plenty of programs out there that allow you to operate your computer as a dumb terminal, there aren't many that allow you to use your computer as a smart packet-oriented communications system. Or personal message boxes. Or gateways. Or automated OSCAR/packet systems. Or...

POSITION OPEN - PAYS THE SAME AS THE PRESIDENCY!

Finally, we need a volunteer with the time, energy and dedication to organize PSX and get it rolling. I will help; but, like Tom, I have too many other commitments that would prevent me from being an effective PSX administrator. *Continued on page 12.*

## PSK MODEMS FOR FO-12

Tom Clark, W3IWI

This is a brief report on FO-12 PSK modem progress. The TAPRites (NOADI, WA7GXD & W3IWI) have been working on an adaptation of the JARL/JAMSAT PSK demodulator described in August 1986 QEX. (The QEX article only covers the 'dem' part of the required modem).

Our plan is for TAPR to make this design available as a reproducable package -- it has not yet been decided whether this will be a full kit or a semi-kit; if it is the latter, then all parts not supplied will be available from Radio Shack, JAMECO, or similar suppliers.

>>> Details will be announced just as soon as <<<
>>> they are decided. <<<
>>> Please don't bug us about availability yet! <<<

There are several differences (all additions) from the QEX design. The modem is designed to work with a TNC1 (including Heath HD4040 and AEA PK-1) or TNC2 (including MFJ, Pac-Comm, AEA PK-80 & GLB TNC2 clones) and connects thru the 20-pin 'modem disconnect' header plus the normal radio I/O jack. The modem has an IN/OUT switch so that you can change between FO-12 and normal terrestrial operation without swapping any cables. If you try to use this design with another type of TNC, you will have to insure that you have access to the RX data input to the TNC at TTL level bypassing the normal FSK demod. You will also have to provide the 'raw' TTL level TX data and TX clock (either 16x or 32x baud rate) and you should also provide a 'carrier detect' input to the TNC (active low) so that the TNC will know when the modem is locked up.

The modem has been designed with digital AFC to interface to any of the more modern all-mode radios. This involves having the radio make 10 Hz (e.g. with TS811) or 20 Hz (e.g. with FT726) steps using the inputs that allow to to step up/down from buttons on the microphone.

Our design includes two modulators: Manchester FSK as required for the FO-12 uplink and 1200 baud PSK. The PSK modulator has been included for two reasons -- it lets you run loop-back tests with the PSK demod, and more importantly, it allows amateur experimentation with PSK packets. PSK should be 10-20 dB superior to the 'Bell 202' AFSK-FM in common use on VHF. The composite PSK signal generated by the modulator is your normal digital data exclusive-or'd with an audio carrier in the 1400 to 1800 Hz range (exact frequency chosen to match your SSB radio's filters).

The design also includes LED 'bar graph' indicators for both received signal level and tuning. The interface to the uplink radio are the normal TX audio and PTT lines. Your transmitter must operate in FM for the Manchester FSK FO-12 uplink or SSB for PSK use. On the receive side, your SSB receiver supplies RX audio to the demodulator, and preferably should support digital frequency stepping for the AFC circuit described earlier.

Here at W3IWI I now have a full functional prototype running. I want to thank Tak Okamoto (JA2PKI) for providing me with JA-land circuit board which made my life a lot easier! I have been running local loopback tests and am convinced that the basic design is sound. 'Eye-patterns' on the PSK demod show that data filters are nearly optimal, and lock-up time is quite acceptable.

The next step in my testing will involve cramming 1200 baud PSK thru ordinary commercial radios to characterize their performance. I have some concern about the filters in commonly used radios since I found a couple of years ago that a stock FT726 was unsuitable for 1200 baud FSK work. Initial testing will be done on the Kenwood TS711/811 pair and an FT726. If someone wants to loan an IC-271/IC471 pair we will glady test them too. I am very anxious to find some other packeteer within 150 miles who has an FO-12 modem running so that I can make real 'on-the-air' tests.

The other 'next step' is to finalize the circuit board layout and test that implementation. We will keep you posted as this work proceeds.

- PRM -

## TAPR PRICE LIST

The following price list is current for October, 1986.

Memberships:
Associate (no PSR/PRM)
$5.00/year
Full (PSR/PRM included)
$15.00/year in the US
$18.00/year in Canada
$25.00/year elsewhere
LSC-10 Coffee Mug
$5.00 (only at Hamfests!)
(see you at Ham/West in Las Vegas!)
Introduction to Packet Video
$10.00 postpaid in the US
(available in VHS format only)
HF Tuning Indicator Kit
$25.00 postpaid in the US
(see October 1985 PSR for circuit)
9600 baud Modem Semi-Kit *
$25.00 postpaid in the US
(see K9NG article in 4th ARRL Proceedings)
FADPAD Xerox 820 Adapter *
$25.00 postpaid in the US
(PC board and data only)
FUJI/OSCAR 12 PSK Modem
To Be Announced
TNC 1 OEM package
$500 one-time charge
TNC 2 OEM package
$5,000 one-time charge plus royalties

neither complete nor supported by TAPR.
* These products are for experimenters and are
neither complete nor supported by TAPR.

- PRM -

## STEALING

It has finally happened!

Amateur packet radio is being plagued by groups pursuing immoral, if not downright illegal, activities. These thieves are, knowingly or not, stealing from TAPR on a daily basis. These are not Robin Hoods; they are doing it to line their own pockets.

And they are not "just stealing from TAPR," they are stealing from you!

As well as the customers who support their activities.

How are they doing this?

They are manufacturing and distributing unauthorized clones of TNC 2 hardware, software and documentation.

Where are the hotbeds of this activity?

Germany and Japan.

There is a consortium of four amateurs in Germany who have reworked the TNC 2 pc layout and are selling, through 4 separate addresses, the PC board(s), parts kits, TNC 2 manual and TNC 2 software ROMs.

Now, there is nothing sacred about the TNC 2 design, and a new PC board is not violating any copyrights. But the TNC 2 manual is copyrighted. And the software is copyrighted as well.

These crooks have been contacted by letter and choose to disregard our requests that they play fair.

Perhaps they think the license cost is too high?

Five dollars (10 Deutsche Marks at curent exchange rates) is a pretty paltry sum to pay for a royalty. They are simply capitalizing on the TNC 2 design work done by TAPR volunteers, and by not supporting TAPR they are robbing the tills of needed capital to continue with networking development.

Their customers, trying to save a very few dollars, are also expecting to reap the benefits of networking when it arrives, but shirking any responsibility for helping to support the development of that network.

And legitimate Amateur dealers in Germany and surrounding areas are losing business to these folks.

Some people call this piracy.

Hah!

THEY ARE STEALING.

They are stealing from the unrequited toil of volunteers who did the TNC 2 design. They are stealing from TAPR, who established the Amateur TNC marketplace in the first place. They are stealing from YOU.

And now, we find a report in Gateway that a thought-to-be respectable Japanese manufacturer of Amateur equipment, Maki Denki Co., is also selling a TNC 2 clone without licensing the design from TAPR. The president of this company was quoted by Gateway as stating that he wasn't doing anything wrong!

What would he think if someone walked into his warehouse and took all his goods, then sold them in the stall next to him at an Amateur show? Would he think they had done anything wrong?

I certainly hope our members and other members of the Amateur fraternity will put pressure on these thieves by not purchasing their products of any type, as well as write to the editors of their respecitve Amateur journals to see to it that no advertising is accepted from these unprincipled people.

If any of you run across any TNC-2-like products from any source that doesn't explicity claim to be licensed by TAPR, please let us know at the office so we can (1) contact them and inform them of the OEM agreement and (2) blow the whistle on them while we (3) map our strategy to deal with them.

Packet radio has been a gentlemen's arena up until now. Let's keep it that way.

- PRM -

## HAM/WEST

TAPR will have a booth at the upcoming HAM/WEST Convention to be held in Las Vegas on Friday and Saturday, November 7th and 8th, 1986.

There will be two packet forums held each day; an introductory session conducted by Dave Pederson, N7BHC, of Utah Packet Radio Association (UPRA) and an advenced session conducted by Lyle Johnson, WA7GXD.

So, whether you are looking for information on packet basics, or want to discuss topics such as satellite or high-speed operation, mark your calendar and plan to attend HAM/WEST '86. Both forums will be conducted each day - consult the program schedule.

See you there!

- PRM -

Renewal Reminder

Please check your mailing label on the front cover of this issue of PRM. *If you are a TAPR member*, there will be a number in the center of the top line. It indicates the month and year of your membership expiration.

If your expiration date is 01-87 or earlier, please take a moment to renew.

Don't put it off, or you may miss an issue or two of PRM and PSR!

## MODS FOR AMATEUR PACKET

### ALASKA HF MOD KIT

Lyle Johnson, WA7GXD

At the Dayton Hamvention I spoke with one of the folks from Amateur Packet Alaska, who have been selling an HF mod kit for the TNC 1 and TNC 2 units. The kit cost $30 back in April; I expect it has not changed.

Upon my return to Tucson, I built the unit (it consists of a PC board, an IC, a few resistors and capacitors, a switch and very clear directions). It went together easily and worked as expected.

However, being the type of person who can't leave well enough alone, and having just been exposed to the modem mods proposed by Dan, KV7B, and Eric, N7CL, I opened the case of my TNC 2 and went to work once more.

I changed the 510k resistor on the header that plugs into socket U19 to 750k, then changed the 226k resistor on the APA board to 180k and the 47k resistor to 36k.

This was fine as far as it went, but there were still two problem areas: baud rate selection lock-detect loop timing.

One drawback of the APA modification kit is that, in order to switch between 300 baud and 1200 baud operation, you need to toggle the supplied switch mounted on the front panel, then reach behind the TNC 2 and fiddle with the baud rate switch.

Not convenient.

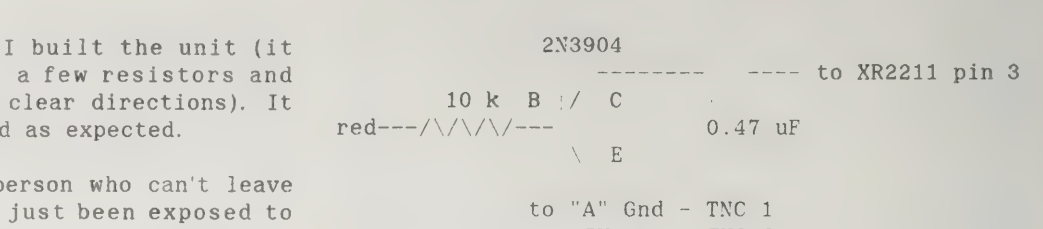
The solution was quite simple. The supplied SPST switch for mounting on the front panel of the TNC was replaced with a DPDT, center-off toggle switch. One pole of the switch was wired up to the APA adapter as before. The other pole was wired up to DIPswitch SW2. The center pin (common) connects to SW2 pins 9, 10 and 11. The 300 baud position of the new switch connects to SW2 pin 6, while the 1200 baud position connects to SW2 pin 7.

When operating, SW2 sections 6, 7 and 8 are left in the OFF position. The new front panel switch now selects the baud rate for the radio port as well as configuring the modem for 300 or 1200 baud operation. If an external modem is connected to the modem disconnect and is to be selected, the front panel switch is simply placed in the center-off position, preventing any interference with operation of the outboard device.

Very convenient!

The last problem is that of lock detect delay (DCD filtering). The 470k resistor and 0.15 uF capacitor connected to the XR2211 demodulator at pin 3 are chosen for 1200 baud operation. At 300 baud, the response time is a bit fast. Alternatively, setting up the DCD lock for 300 baud operation causes things to be unecessarily slow at 1200 baud.

The solution I used was to incorporate a 2N3904 transistor switch to connect a 0.47 uF capacitor in parallel with the 0.15 uF at U20 pin 5. The 2N3904 base is connected to the APA circuitry at the front panel switch such that it is biased on (+5 volts) in the 300 baud position and biased off (-5 volts) in the other two positions (off and 1200 baud). A 10k resistor is inserted in series bewteen the 2N3904 base and the baud select switch (red wire). See below.




I have used my modified TNC 2 with modified APA modifications (whew!) for several months now and, while I can't guarantee that you will work all the signals you can't hear, it has proven to be a very convenient system for HF operation at WA7GXD.

Contact Amateur Packet Alaska, AX.25 Communications Trail, Esther, AK for current price and delivery on their HF modification for the TNC 2. And of course, TAPR has an HF tuning indicator kit available for a paltry $25. The combination is dynamite...

See you on 20 meters!

- PRM -

## TAPR MOVES TO COMPUSERVE

Pete Eaton, WB9FLW

Effective 1 November 1986 TAPR will move its telecommunications from DRNET to Compuserve's HamNet Special Interest Group.

With this move TAPR hopes to make it's activities and projects more well know to others around the country. At the same time it should make communications between all Packeteers more open.

- PRM -

*President - continued from page 9.*

NNC UPDATE

The NNC modem board has been made operational. During this month (October), the NNC Alpha sites should be shipped their modem boards! This should serve as another catalyst to get the networking software development effort continuing forward.

Stay tuned!

- PRM -

## TAPR DIRECTOR NOMINATIONS

It is that time of year again.

No, I am not referring to congressional and other state and local politcal contests. I am referring to your TAPR Board of Directors.

As you probably know (but some of you newer members may not), TAPR is governed by a fifteen-member (15-count 'em! That's more than General Motors!) Board of Directors. Each Director serves a term of three (3) years, and, due to staggered terms, one-third of the Board, or five (5) Directors, are elected every year.

The current Directors' terms expire as follows:

| | | |
|---|---|---|
| Mike Brock, WB6HHV | | Feb 1988 |
| Tom Clark, W3IWI | * | Feb 1987 |
| Pete Eaton, WB9FLW | * | Feb 1987 |
| Andy Freeborn, NOCCZ | | Feb 1988 |
| Steve Goode, K9NG | | Feb 1989 |
| Eric Gustafson, N7CL | | Feb 1989 |
| Skip Hansen, WB6YMH | | Feb 1988 |
| Lyle Johnson, WA7GXD | | Feb 1989 |
| Scott Loftesness, W3VS | | Feb 1989 |
| Dan Morrison, KV7B | | Feb 1988 |
| Margaret Morrison, KV7D | * | Feb 1987 |
| Harold Price, NK6K | * | Feb 1987 |
| Bill Reed, WDOETZ | | Feb 1988 |
| Gwyn Reedy, W1BEL | | Feb 1989 |
| Pat Snyder, WA0TTW | * | Feb 1987 |

Nominations are now open for the seats expiring February, 1987 (marked with an asterisk - *).

Any member of TAPR may nominate any member for the Board.

To place a name in nomination, just send a letter to the TAPR office with the name of the person you wish to nominate (including yourself, if you like). It would be helpful if you would also provide us with your nominee's telephone number and any qualifications you think your nominee has for the office.

We will then get in touch with him (or her) and obtain the person's direct consent to run. At that time we will ask for a statement from the nominee for publication in PSR. (We won't print your picture, so don't let that stop you!)

"What is required of a Director?" you ask.

A Director is expected to attend the Board of Director's meeting and TAPR Annual Meeting in February of every year in which he (or she) holds office. The meetings are held in Tucson, and TAPR does not reimburse expenses for this trip. This means, depending on where you live, a commitment of a few hundred dollars per year.

The Board of Directors reviews the previous year, establishes goals, elects the Officers, and generally guides the organization.

The schedule for this term's election process is as follows:

| Event | Time |
|---|---|
| Request for Nominations | October 1986 |
| Deadline for Nominations | December 15th, 1986 |
| List of candidates and ballot | January 1987 |

So, submit the name of someone you think will do a good job and get it in to the TAPR office today!

**NOMINATION FOR TAPR BOARD OF DIRECTORS**

I,_____, as a member of Tucson Amateur Packet Radio, would like to place the name of TAPR member _____ under consideration as a candidate for election to the TAPR Board of Directors.

Signed_____ Date _____

## TAPR ANNUAL MEETING

Tucson Amateur Packet Radio will be holding its annual meeting during the weekend on February 21 and 22, 1987.

Your Board of Directors plans to meet all day on Friday, the 20th.

Friday night activites will include the traditional Pizza gathering, followed by racing at the Malibu Grand Prix.

Saturday, the Theatre Royale at the Granada Royale Airport Inn is reserved from 9 AM through 5 PM. The day's activities will include presentations from packeteers from various areas on numerous subjects. As in previous years, a catered lunch will be served.

Saturday night, we will gather at the Triple-C Chuckwagon Ranch for an old-fashioned western meal and entertainment.

Sunday morning the Theatre Royale is again reserved from 9 AM until 1 PM. This is to allow more and better presentations during the meeting.

The early afternoon adjournment should provide ample time for folks to drive home or catch a plane from Tucson International Airport.

More details will be published as the big weekend approaches. If you want to speak, please write to the TAPR office and let us know so we can begin planning early.

See you in February!

NOTE: Since the Board will meet on Friday, all voting must be done by mail. No ballots will be accepted at the annual meeting, so those of you accustomed to procrastinating until then will be find yourselves disenfranchised! Please vote in a timely manner, using the ballot that will be found in your January PSR.

- PRM -

(The following article was submitted to TAPR by JA1DSI. It was written in February of this year, and shows how one enterprising Amateur made an hf modem system for his AEA PKT-1. The idea is similar to that of the AEA PM-1 and PacComm PTU-200.)

## *HOW TO GET ON HF WITH THE PKT-1*

Minoru Tsuda, JA1DSI

WHY MODEM-1 IS TUNED FOR 2125/2325 Hz

We RTTYers use a monitoring 'scope to observe the cross pattern generated by our filter-type TUs (tuning units, or modems). The standard frequency pair used on HF RTTY is 2125 Hz and 2295 Hz. Since tuning HF packet signals can be a tedious chore, I thought it would be good if I could use my existing RTTY monitor scope. By using my my RTTY scope and my RTTY TU, I can then precisely tune my rig for best data recovery from my phase lock loop (PLL) based packet demodulator.

In addition, if you have an FSK mode on your HF transmitter, you may use it for sending HF packet signals. It will work best if it can be adjusted to provide a 200 Hz split rather than the more common 170 Hz shift used on RTTY. And, if your rig has an FSK mode, it will probably also use the tone pair of 2125 and 2295 Hz.

Hence, I chose the frequency pair of 2125 Hz and 2325 Hz for 200 Hz shift HF packet work.

AUDIO LEVEL SETTINGS

As you know, the TNC will not send frames if the data carrier detect (DCD) line is on, whether from signals or from noise. For this reason, a CMOS analog switch is installed between the XR2206 tone keyer (1200/2200 Hz) and the AF-output terminal of modem 2.

Without the switch, 1200/2200 Hz tones will be continuously sent to the TNC, resulting in a "channel busy" condition being present at all times. This will prevent the TNC from ever transmitting!

The switch is driven from the DCD output of modem 1. If no signal is detected by modem 1, the tone keyer output will be switched off and the TNC will not be hindered from sending frames. On the other hand, when the demodulator in modem 1 senses a signal (or the right kind of noise!), the switch will be closed and the TNC will "see" the data carrier, thus preventing it from transmitting.

When your computer, TNC, rig and DSI interface (!) are all connected together, you will see the DCD light go bright often with signals from your HF receiver is the audio drive to the demodulator in the DSI interface is adequate.

If the audio level is too high, the DCD light will almost never go off, preventing you from transmitting. If the audio level is too low, you will never decode any HF packet signals!

In the end, you must experiment to find the best audio settings for your HF rig AF gain and the DSI interface's trimmer VR10.

If your HF rig has a squelch control that is effective in the SSB and/or FSK modes, use it as you would use a squelch on VHF/UHF. This will help speed your traffic along. With no squelch control, the AF and RF gain controls must be set carefully or you will spend a lot of time with your DCD LED glowing and your TNC inhibited from sending! This makes HF packet traffic dull and time-consuming!

YOU CAN GET ON HF PACKET RADIO IN "FSK", "LSB" AND "USB" MODES!

If you only operate on VHF/UHF packet radio, you will probably never think about "mark" and "space" polarities at all!

But, on HF F1 (Baudot/AMTOR and Packet Radio), we can't help thinking of this "polarity" problem. It is really important for us on HF RTTY.

At first, when I started on HF packet radio, I thought I had to make the polarity right. But later, I became aware that this is meaningless. Packet radio uses non-return to zero, inverted (NRZI) encoding; a data value of "0" causes a transition between tones and a "1" results in no change of tone. Thus, there is no "mark" or "space" in HF packet.

The end result is that, unlike RTTY, polarity is unimportant for HF packet operation. We can enjoy HF packet with FSK, LSB or USB modes without thinking about polarity. This is fun, strange and fascinating for RTTYers!

ACTUAL ADJUSTMENT OF THE TWO-STAGE MODEM

MODEM 1 (2125/2325 Hz)

XR-2211: Cut 510k-ohm resistor across pins 7 and 8. Connect a DC voltmeter (5 to 10 volt range) between pin 7 and ground. Inject an AC-coupled 2225 Hz tone (this equals (2125+2325)/2) into the input terminal of the XR2211 and carefully set VR-4 (10 k-ohm) to cause a transition (0 to 5 volts, or 5 volts to 0). Don't forget to reconnect the 510k-ohm resistor between pins 7 and 8 when you are done.

XR-2206: Connect an oscilloscope at the output terminal of the XR2206. Set the 25k-ohm trimmer (between pins 15 and 16) for a clean sine-wave signal. Set the 50k-ohm trimmer for a stable, large-amplitude sine wave. Next, connect an audio frequency counter at the output terminal of the XR2206 and adjust VR-5 (10k-ohm) for 2325 Hz with pin 9 open and VR-6 (10k-ohm) for 2125 Hz with pin 9 shorted to ground.

MODEM 2 (1200/2200 Hz)

XR-2211: Set this up the same way as modem 1, excpet inject a 1700 Hz signal and set adjust VR-3 (10k-ohm) for the transition.

XR-2206: Like modem 1, except adjust VR-1 (20k-ohm) for 2200 HZ and VR-2 (30k-ohm) for 1200 Hz.

LOOP BACK TEST (SELF-CHECK)

Without connecting the DSI interface to the HF rig, you can check the modem. Connect AF-IN to AF-OUT of modem 1 and try to send a beacon. Of course, set the TNC to MONITOR-ON. What a strange and fascinating scene we have! We can see our own beacon! If you see your own beacon in this test, your DSI interface is operational.

As a final check, you may want to connect to yourself. Try it!

I have heard that this test is described in the instruction manual for the TNC 2, but I discovered the technique by chance. One day, I happened to to be sending a beacon and monitoring the transmitted tones by use of my TS-940S' "MONITOR" on mode. I was quite surprised to see my own beacon on my computer's CRT.

RECOMMENDED PARAMETERS ON HF PACKET RADIO

I do not know the prevailing and common parameters used in the United States. Under my short experience, I have already learned several things through actual contacts. Note that these settings are for the TNC 1.

(1) AXD: 6 to 10. Longer AXD will send long idles (not frames) and this is very useful and helpful for others to tune in. With a longer AXD, every HF rig can receive and send frames. But too large a value for AXD will make our traffic slow. Try AXD 15 sometime and see what I mean!

(2) TXD:4. This means delay time from PTT on to starting to send idle defined by AXD. Not so critical; 1 to 4 seems to be OK. Too long a TXD is useless.

(3) PACLEN: 40 to 80. Too small a PACLEN makes traffic move slowly because of the need for many ACKs. And we must remember that one frame includes many bits which will not show on our CRT and have nothing to do with the information we wish to send! On the other hand, too long a frame will increase the chance for a bit error due to HF propagation.

(4) MAXFRAME: 1. On HF, with the normal noise, QSB and QRM, bit errors will often occur. Due to these conditions, there isn't much opportunity to ACK several frames at one time. Thus, it is best to send only a single frame at a time. If we use a large MAXFRAME, our traffic will often be stuck for a long time and the link will go down if RETRY is set to other than 0. So, we have to reconnect and fight the QRM, QRN and QSB.

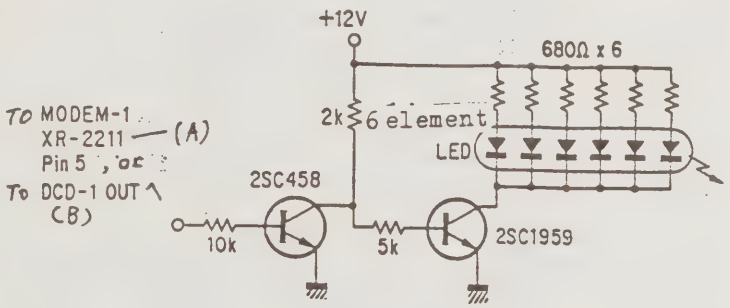
(5) RETRY: 0 (infinite!). There are two schools of thought on this parameter. One is to set RETRY smaller than that on VHF/UHF. In this way, the link often goes down. Worse, the other station may continue to send data indefinitely, not realizing that that our station has RETRYed out and disconnected. This can be demonstrated by setting up our HF station with MONITOR ON, and MCON ON.

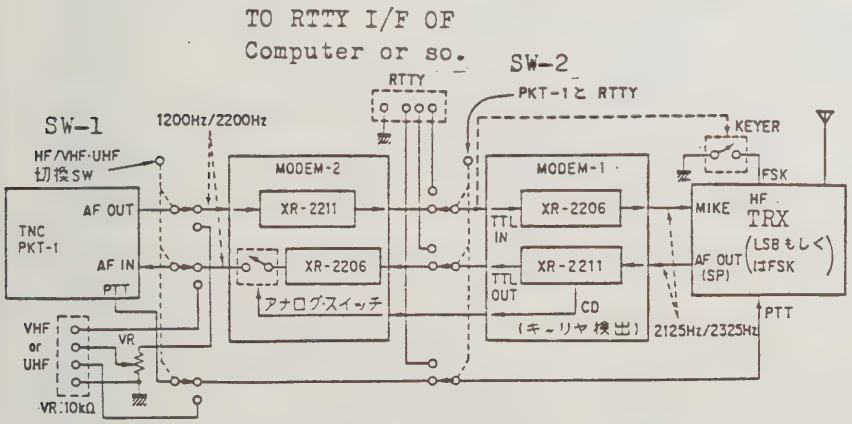
Therefore, I would like to recommend that HF stations use RETRY = 0! If both stations in a QSO use this value, we do not need to be afraid of sudden link failures. Besides, we can practice our tuning technique if there are plenty of retries. When you want to disconnect the link, you can always enter CMD: mode and set RETRY to 1, then issue a disconnect command.

(6) MCON: ON (if needed). Generally speaking, we can get clear and beautiful copy with MCON in the OFF state. But, in case you want to see how traffic is on the channel, you can watch things by setting the MONITOR mode ON on your HF rig. This way, you can see how often you retry to get your data through. If things get stuck, you can then disconnect.

- PRM -

BIG DCD-1 INDICATOR




SCHEMATIC DIAGRAM (CONCEPT)

ADA SYSTEM (AUDIO — DIGITAL — AUDIO)

*More schematics on page 16.*

ZERO-IN : LED ON
OFF QRG : LED OFF
With noise input, LED goes on and off frequently . This is normal state.
Adjustment of AF output level of HF TRX is very important:
too high : LED is on all the way. TNC will not go to send.
too low : LED is never on. TNC will not decode anything (you can't receive).
VR-11 is also very important to let this interface work well. It is the best that DCE-LED(PKT-1) and DCD-1(this interface) are on & off in parallel (namely, simultaneously On and Off).

## AX.25 WORKS!
## SO LET'S CHANGE IT

Lyle Johnson, WA7GXD

At least one manufacturer of Amateur packet gear has requested a special PID (Protocol IDentifier) to allow his TNCs to interrogate a remote unit to see if it can handle special enhancements that manufacturer desires to incorporate in his products.

This was brought to the attention of the ARRl Ad Hoc Committee on Digital Communications at its June Meeting in Newington.

The Committee discussed the proposal and decided that the PID byte was the wrong place to perform this sort of interrogation. Instead, the use of an XID (eXchange IDentifications) frame is indicated. Such a frame exists in many link-layer virtual circuit protocols, including the V-2 protocol being experimented with in Canada.

I have heard of a number of suggestions (complaints?) regarding AX25 Level Two, ranging from perceived errors in the protocol, through enhancements to bug fixes in specific implementations.

What I would like you to do is think about the protocol and any observations you may have on its operation. If you have any suggestions that you think would improve its performance, enhance its reliability or link-level features, please note them and send them to the TAPR Office. If you are proposing a chnage, please include examples or other arguments supporting your opinion.

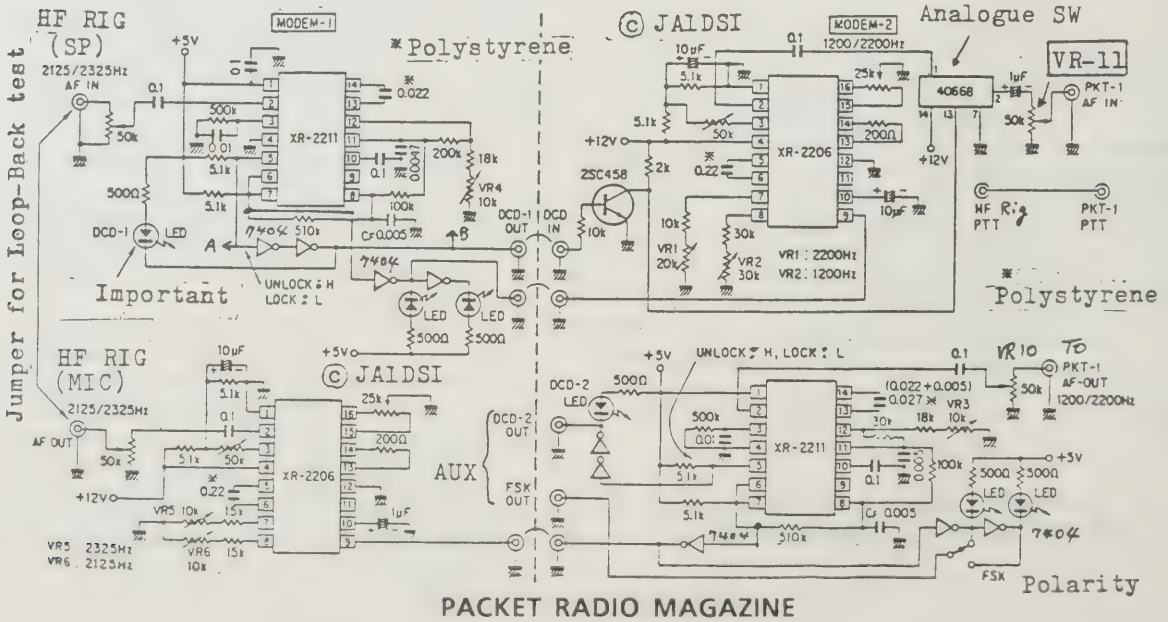
These will be compiled and sent on to the ARRL Committee. The next meeting will probably be held before the end of the year, so please act today!

- PRM -

FROM:"Mobile Ham" Magazine
(March, 1986, Tokyo)
How to get on HF with PKT-1

by Minoru Tsua (JA1DSI)

SW-1 and SW-2 are not shown in this figure. Add those if you need.




## TAPR MEMBERSHIP APPLICATION

Tucson Amateur Packet Radio Corporation
P.O. Box 22888, Tucson, AZ 85734

Name: _____

Callsign: _____ License Class: _____

Address: _____

City & State: _____ ZIP: _____

Home Phone: _____ Work Phone: _____

If you wish to have any of the above information not be published in a membership list, indicate the items you wish supressed: _____

I hereby apply for (**select one**) standard/associate membership in Tucson Amateur Packet Radio Corp. I enclose $15.00 (standard) / $5.00 (associate) for one year's membership dues. I understand that $10.00 of my standard dues are for subscription to the PACKET RADIO MAGAZINE (PRM). Associate members do not receive any publication. The entire amount of the associate membership dues and $5.00 of the standard dues go to support TAPR's research and development activities in packet radio. My signature indicates that I desire to become a TAPR member, and subscribe to PRM (standard members only).

Signature: _____ Date: _____

The Tucson Amateur Packet Radio Corporation is a nonprofit scientific research and development corporation. The corporation is licensed in the state of Arizona for the purpose of designing and developing new systems for packet radio communication in the Amateur Radio Service, and for freely disseminating information acquired during and obtained from such research.

# FADCA > BEACON

## THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION

### *BROWARD LAN FORUM*

Joe Loewy, KB4FO

A forum for providers was held at Sunrise, Florida on Saturday 9/27/86. One of the main items considered at the forum was an attempt to define the characteristics and responsibilities of those who may be considered providers such as fill time BBS and digipeaters operators and the relations with the users.

We sketched the coverage at present in Dade, Broward and adjacent areas. It was apparent that the West Palm Beach Broward area is pretty well covered by digipeaters. Dade seems to be less solidly covered.

We now have the beginnings of a contingency plan. We have the phone numbers and know how to reach each other if required. Some are ready to step in with equipment and identifiers, so we can the patch less obvious.

There is concern about the Naples LAN being isolated and a plan to try to bring them closer to the rest of the network was discussed. At the present time, are going to try aiming their digipeater antenna towards BCR (Boca Raton). It seemed that this would provide the best quick fix. The PLA (Plantation) group expressed a desire to help solve the problem with a dedicated 220 mHz. link. The two groups will continue to work to resolve the problem.

SUN (Sunrise) on 145.03 will probably be increasing ERP by 6 to 9 dB which will improve the path to Miami for the BBS forwarding. At the present time FTL (Ft. Lauderdale) is serving as a fill in.

There was a lot of interest in the area of TNC parameters and I believe that the general feeling was the those in PACKET POOP are the best starting point.

One issue skirted was what to do with the BBSs when the backbone network comes online. These issues could not be addressed because of the lack of SYSOPS in attendance because of the lack of sufficient notification.

The issue of standardized SSID assignments was discussed with the idea of adopting a plan which would be applicable to the State and give users a clearer view of what a station is, i.e. digipeater, BBS, second station, etc.

Issues raised and intended to be forwarded to the Florida Network Coordinating Committee include:

- o TNC/BBS parameter recommendations
- o Standardized SSID assignments
- o Possible network configurations for East-West vs. North-South frequencies
- o Possible use of opposite antenna polarization to reduce unwanted path interference
- o Implementation of a Statewide info system for new users.

We hope the forum was of value and anticipate holding others.

- PRM -

### *MELBOURNE HAMFEST RECAP*

Fm : Howie Goldstein, N2WX
To : All MLB fest attendees
Re : Thank you for coming!

Thank you for coming to the 1986 PCARS hamfest, which featured the 3rd annual appearance of the FADCA/Brevard LAN's packet booth.

Quite a few people dropped by the table this year to talk packet (voice, that is) with each other, and to gawk at Chuck WA4GPF's sexy PAC-ET-TERM screens. At no time Saturday was the aisle adjacent to the booth passable without great difficulty. What better indication that the display was a success. Thanks are in order to all those who put in time manning the booth, something that some consider a pretty dull thing to do during a hamfest.

Saturday night about a dozen packeteers and YLs met at the Sizzler steak joint for some serious talk about RFI, networks, and BBSs.

Sunday morning a rescheduled packet forum happened. Despite the fast switch in meeting time (it wasn't until Hamfest Saturday we realized that the hamfest flier said "10 AM" when all the pre-hamfest info told us "2 PM"), perhaps 30 packet and non packet types met in the FB off-site facilities provided by WA4NBE. Both questions and answers flowed freely for well over an hour.

At the end of the day, huge thunderstorms rolled in, most of the packet people were on their way home or there already (none heavier with grand prizes, alas), and everyone started thinking about how different packet will be by the next Melbourne hamfest.

- PRM -

** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
** **FADCA is coordinating our digipeaters in Fla.** **
** **If you are planning to put up a digipeater,** **
** **contact FADCA at 812 Childers Loop, Brandon,** **
** **FL 33511 for registration forms.** **
** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **

## BREVARD COUNTY LAN NETS

Bill Newkirk, WB9IVR

The Brevard Packet Radio Roundtable meets 8 PM Sunday on the 146.85 Melbourne repeater. All are invited to check in with net control and enjoy discussing packet topics.

The SBARC Upgrade Class meets on Fridays at 7 PM at Florida Institute of Technology in room Q-2. The class includes code and radio theory and lasts until 9:30-10 PM. More information, contact Al Spechler, KB4QVT, 724-2497.

The SBARC Novice (and beyond) Class started on August 25 and meets every Monday at Hoover Junior High School in Indialantic at 6:30 PM. Nineteen people have registered for the class led by Bill Newkirk (WB9IVR), Earl Hatch (KA4UQK), and Bob Burton (AA4QA).

Exams will be held on the 3rd Saturday of each month at Florida Institute of Technology in room Q-11 starting at 10 AM. Registration begins at 9:30 AM. For more information, contact Bill Newkirk, WB9IVR, at 724-6183.

Check into the Friday Friendly Family of Fearless Florida Fertilizer Flingers on Friday nights at 8 PM on 146.55 mhz simplex.

Apple announces a replacement for the Apple //e computer, the Apple //gs computer. The GS series computer consists of a set of very high integration arrays with a 16 bit version of the 6502 (65C816) used for the processor for compatibility with existing Apple // software. The //gs is priced at $999 for the system unit. Existing //e and //e enhanced computer owners may upgrade their systems for $499. Other features include 256K memory standard, a 15 voice audio synthesizer, slots compatible with the slots in earlier Apple computers, and the ability to have a maximum of 8 Megabytes of random access memory in the system. Support for the AppleTalk network will be available. File servers on that system will be able to support a mix of Apple // and MacIntosh computers sharing printers, disks, and other devices.

You've seen it in the ads for various TNCs - "Supports FADCA style repeater identifiers (305MLB)..." Another way to make it into posterity. We're famous! Now if we can just get the rest of the world to convert...a few visitors to the area relate stories of areas that have not seen the light yet.

Maybe in another couple of years we can look forward to a special digipeater/switch section in the callbook. Or maybe at least a separate section in the Repeater Directory. [Digipeaters are listed in the special modes section of the 86-87 ARRL Repeater Directory...ED]

PRM -

## PACKET AND THE ATARI ST

Chuck Harrington, WA4GPF

With complete monochrome 520 ST systems now sale priced at under $500.00, the ST is an excellent computer to meet many of our present and future packet needs.

For a BBS, an ST would be an excellent choice. The speed and memory of the ST can offer many features not currently available on the Xerox 820 systems. Although phone BBS software is not well suited for packet use, BBS 2.0 by MichTron for the ST has an interesting feature; MULTI-USER capacity! The BBS operator and one caller can both use the BBS at the same time, Independently! Wow, think what that could mean. The sysop of a packet BBS need no longer lose the use of a computer that has been dedicated to a mailbox. While the BBS is servicing another station, he uses the ST and channel B of his TNC to support his own packet connects! Or perhaps the ST computer is used for word processing or some other task, while allowing the BBS to continue in normal operation. Maybe the ST could service two ports on different bands, the difference being that two stations could use the same BBS simultaneously. Or message forwarding could be taking place on the trunk line, while regular use of the BBS continues on another frequency.

The ST's multi-tasking abilities offer similar advantages to other packet users. How many times have you taken your computer off line for word processing or some other use, and then had someone connect with you? This event used to require me to save my work, and run the terminal program so that I could respond to the connecting station; with the ST, life is more simple. One nice feature of the ST is its "desk accessories", and among the ones received with every ST is the VT-52 terminal emulator program. Now, when my Heath TNC's "fog horn" blows, alerting me to the fact that a connection has taken place, I can quickly respond without leaving the GEM program I am running. I simply use the mouse to point at "VT-52" on the Desk Accessory menu, and I am in the terminal program responding to the connection. When I am done, touching the <UNDO> key returns me back to word processing or whatever!

The ST has the power and the price to bring advanced capabilities to our packet networks. But, before this can happen, ST owners need to invite their friends over to use their STs. Too many people are not getting past the name Atari on the front, and don't understand that the ST is NOT a game machine, and related to the old 8 bit Atari computers in name only. Atari today is a very prosperous company and much more financially sound then Commodore or many other computer manufacturers. The head of Atari, Jack Tramiel, intends to make "The New Atari Corp." the largest manufacturer of personal computers in the world!

Before dismissing this as ridiculous, consider the success of Mr. Tramiel's last product, the Commodore 64! One thing for sure, the ST is here to stay and the line is expanding.

Atari has a number of new ST related products coming out that are of interest. An IBM emulator, due out soon, allows the ST to run the "big ten" of the MS DOS software. The "box", which will connect through the ST's hard disk port, will have its own 8088 CPU and ram. When not running MS DOS, the emulator's 512K RAM will be available for use a RAM disk. The price of the IBM emulator is expected to be under $300.00. ALSO expected soon is a new 1200 baud phone modem, which will break the $100.00 price barrier for the first time.

One of the more interesting items which "may" soon be available, is a Macintosh adapter cartridge for the ST! The adapter turns a 1 Meg monochrome monitor equipped ST into a Macintosh. This product was shown recently at the West Coast Computer Fair running popular Mac software. The "M-Cartridge", which will be sold by Data Pacific, needs real Apple Macintosh ROMs, and therefore bringing it to market may require the cooperation of Apple, which is unlikely. Apple recently reminded its dealers that Mac ROMs should only be sold to Macintosh owners! It is possible that the cartridge will be sold with the ROM sockets empty, leaving the procurement of the custom chips up to the user. I hope that somehow the Mac emulator's designer and Apple can come to terms; I would enjoy using MACPACKET on my ST. Speaking of ST packet terminal software, PACK-ET-TERM is now in use in many states and reportedly has even been shipped to England! (The ST is the number one selling Micro in Europe!) For those who just tuned in, PACK-ET-TERM is my packet specific split screen terminal program for the ST line. It was developgd to introduce the ST to packet radio and is available at no cost. If you have a phone modem, you may download the files PACKDED.TOS, PACKTAPR.TOS, and PACK.DOC from the McDonald Development BBS system at (305) 886-1632. You may also get the program from a friend, or send me a check for $4.00 to cover the disk and shipping and I will get it right out to you.

Next month we will look at other new ST products, and coming soon, a major change in PACK-ET-TERM.

- PRM -

## SUBDIRECTORIES

Frank McPherson, KB7TV

Directories and Subdirectories are new to a lot of people. With the advent of the WORLI BBS clone by WA7MBL, the usage of directories and subdirectories are becoming more and more wide spread. In order to make full usage of them, you need to understand the why and how of these creatures.

Let's say that you have a hard disk with a lot of space on it. Let's say that you have a lot of files that you want to put on that disk. As you keep on putting these files on the disk, it becomes more and more unmanageable. You want to search the directory to find out what you really called a particular file. You would have to wade through an awful lot of file names just to find one.

Wouldn't it be nice if you could catalogue the files, or better yet, categorize them. If you were looking for a program that was a utility, then why not look in a directory called UTIL? You could put your editors and word processors in a directory called EDIT. You could put your operating system in a directory called MSDOS. And you could put all of your BBS files, programs, etc. in a directory called BBS.

Now, let's carry this another step. Within the BBS directory, you want to keep your programs and control files hidden from the users of the BBS. You also want to have a special place for all the messages. You also want to keep bulletins, programs, and special files available to the user. This is where we get into the subject of subdirectories.

Let's keep all the messages in a SUBdirectory called MAIL. Let's keep all the files that a user can download and have access to in a SUBdirectory called FILES. Now we have a directory called BBS and two SUBdirectories called MAIL and FILES. These SUBdirectories are an extension of the root directory, in this case BBS. BBS is a directory in the main root directory.

What does this mean so far? If you want to put a document someplace where the user can get to it, you will place it in a special subdirectory just for him. He will have access to no other directory or subdirectory. In this way, you keep your own personal files on the same disk and still have privacy. Let's give thg user the subdirectory FILES. So, if you want to place a file where the user can get to it, let's say BBS.DOC, you would have to place it in the subdirectory FILES, which is an extension of the directory BBS. The command under DOS would be:

```
COPY BBS.DOC \BBS\FILES\BBS.DOC
```

Ok, now we have a file out there that a BBS user can get to. However, you have some ARRL bulletins, to go out there too. So let's create another subdirectory called ARRL. However, since we want the user to be able to get at it, it has to be a subdirectory under FILES. So let's place ARRL Bulletin # 27 out there. The following command would accomplish this:

```
COPY ARRL27.DOC \BBS\FILES\ARRL\ARRL27.DOC
```

Starting to get complicated? At first, it is. However, isn't it much nicer to just look in the ARRL subdirectory if you want to see what the ARRL bulletins are? Just hang in there, it'll all start to make sense, (I hope).

In the example given above, the ARRL subdirectory is a subdirectory of FILES. FILES is a subdirectory of BBS. This makes ARRL a sub-subdirectortory. Yes, you can keep going. You san have a PACKET subdirectory of FILES. And you can break PACKET on down between TNC1 and TNC2.

Now for the fun one. Programs! You can have programs that are ham related. Programs that are games. Programs that have a specific purpose. Programs that have a general purpose.

*More >>*

*Subdirectories - continued.*

To the novice user, this is a lot to take in all at once. So we have to make it more user friendly. Since the only directory we are allowing the user to get to is FILES, then anything we put out there for him, must be somewhere under the FILES subdirectory. So, let's write the program so that he only has to enter everything AFTER FILES. For example, if he wanted to download the ARRL27.DOC, the command he would issue is:

```
D ARRL\ARRL27.DOC
```

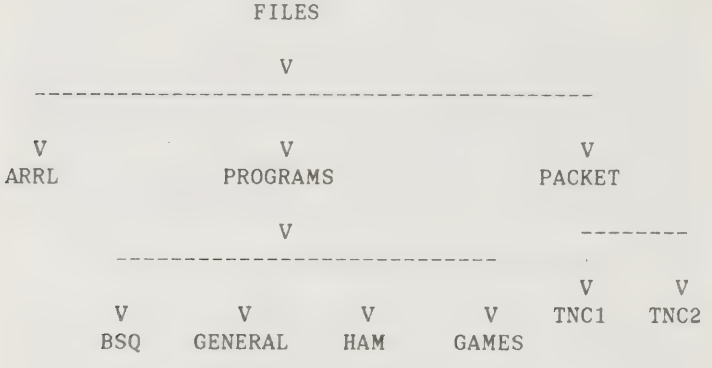
Now isn't that a lot simpler. The program automatically appends:

```
\BBS\FILES\
```

to the front of everything the user sends him. If the user wanted to see what was in the ARRL subdirectory, he would enter:

```
W ARRL
```

Now, let's go another step. Let's get into the PROGRAMS subdirectory of this whole thing. Let's say that we have a PROGRAMS subdirectory that is sub to FILES. We also have the following categories of PROGRAMS: HAM, BSQ, GAMES, GENERAL. That means the subdirectory tree would look something like:




So here is a typical subdirectory tree of a Packet BBS. If you are only interested in reading about TNC2 information, you don't have to go weeding through all the rest of the files. This is what they call, PROGRESS?

Remember, your commands are the same as with any RLI BBS, except that you would specify everything on down AFTER FILES. Also, a "/" or "\" will work.

- PRM -

### *TNC-1/PKT-1/HD-4040 PARTS*

Bob Boyce has a good selection of parts including HDLC chips at attractive prices. Call his answering machine on either (305) 965-0000 or (305) 964-0000.

PRM

## *PBBS LIST BY STATES*

| ST | CITY | CALLSIGN | Observations |
|---|---|---|---|
| AL | Auburn | N4HY | |
| AL | Bessemer | WA5RAX | |
| AL | Headland | WB4RHO | |
| AL | Huntsville | WB4ZKX-1 | |
| AZ | Camp Verde | N5EDH | (VHF/14.107 GW) |
| AZ | Dewey | KE7CZ | (HF/VHF GW) |
| AZ | Phoenix | K7BUC | (145.110/14.103 GW) |
| AZ | Scottsdale | K7PYK | (VHF/14.107 GW) |
| AZ | Sedona | KR5S | |
| AZ | Sedona | WB7BNI | |
| BC | Vancouver | VE7TOM | |
| CA | Brea | WB6KAJ-1 | (VHF/14.103 GW) |
| CA | Camarillo | N6LUC-1 | |
| CA | Chatsworth | WB3ANQ | |
| CA | Gilroy | AA4RE-1 | |
| CA | Hollister | KE6BX | (VHF/14.107 GW) |
| CA | Palo Alto | N6IIU-1 | |
| CA | Pomona | WB6KQY | |
| CA | Rancho Cucamonga | KD6SQ | (HF/VHF GW) |
| CA | Redondo Beach | NK6K | |
| CA | Richmond | NI6A-1 | (VHF/HF GW) |
| CO | Colorado Springs | K0HOA | (VHF/14.103 GW) |
| CO | Denver | WA6ERB | |
| CO | Durango | KD0DI | |
| CO | Golden | W1HAB | |
| CO | Loveland | K0VLD | |
| CO | Walsenburg | KC0QJ | (VHF/14.107 GW) |
| CT | Middletown | KE3Z | |
| CT | Newington | WA2FTC-1 | (145.01/14.107 GW) |
| CT | Newington | W1AW-4 | (ARRL HQ station) |
| CT | Weatogue | NE1H | |
| FL | Boynton Beach | KB7TV | |
| FL | Miami | K0KBY | (145.03/14.107 GW) |
| FL | Miami | K4TKU | (145.01/145.03 GW) |
| FL | Ocala | K4OZS | |
| FL | Orlando | K4AHO | (145.01/145.03 GW) |
| FL | Palm Bay | N2WX-1 | |
| FL | Port Charlotte | KB4CIA | |
| FL | Port St Lucie | WD4KAV | |
| FL | Stuart | WD4BRF | |
| FL | Tampa | KC2FF | |
| FL | Wimauma | WU4W | |
| GA | Altanta | WA4VMV | |
| GA | Atlanta | N4CI | |
| GA | Cohutta | W4KAU | |
| GA | Macon | K4ICT | |
| GA | Marietta | KI4XO | (VHF/14.107 GW) |
| GA | Moultrie | WB4ZNW | |
| GA | Sycamore | WD4LYV | (145.01/7.093 GW) |
| IA | Ames | KI0Q | (HF/VHF GW) |
| IA | Ames | NA0P | |
| IA | Ames | NA0S | |
| IA | Battle Creek | KC0OJ | |
| IA | Cedar Rapids | WA0RJT | |
| IA | Des Moines | WA0JFS-1 | |
| IA | McCallsburg | N0AN | (VHF/HF GW) |
| IA | Roland | AI0Z | |
| IL | Edwardsville | WB9FLW | |
| IL | Mendota | W9ZTK | |
| IL | Naperville | WB9MJN | |
| IL | Sterling | KA9BEN | |
| IL | Urbana | K9JA | |
| IL | Urbana | W9CD | (145.05/147.55 GW) |
| IL | Vernon Hills | WA9DZS | |
| IN | Anderson | WA9WQS | |
| IN | Delphi | KM9D-1 | |

| | | | |
|---|---|---|---|
| IN | Evansville | N4XI | |
| IN | Fort Wayne | N9BAC | |
| IN | Indianapolis | WB9CNE | |
| IN | Valparaiso | WA9UXP | |
| IN | Westfield | W9ZRX | (VHF/HF GW) |
| KY | Elsmere | KD9PU | |
| KY | Lexington | KF4NB | |
| LA | Baton Rouge | WD5ELJ | |
| LA | Layfayette | W5DDL | |
| LA | Sulpher | WA5VDM | |
| MA | Acton | WA1RAJ | (145.09/221.11 GW) |
| MA | Brookline | W1GOH | |
| MA | Dudley | WB1DZK-4 | |
| MA | Lawrence | WA1WLV-1 | (145.01/14.107 GW) |
| MA | Lexington | K1BC | (145.09/221.11 GW) |
| MA | Mattapoisett | W1ZHC | (145.01/221.11 GW) |
| MA | Wakefield | K1UGM | (145.01/221.11 GW) |
| MA | Westford | WORLI | (145.07/14.107 GW) |
| MA | Westford | WORLI-1 | (145.07/221.11 GW) |
| MD | Annapolis | WB4APR | (145.05/HF GW) |
| MD | Baltimore | KS3Q | |
| MD | Clarksville | W3IWI | (145.01/145.05 GW) |
| MD | Granite | K3VPZ | (HF/VHF GW) |
| MD | Mount Airy | W3TMZ | (HF/VHF GW) |
| ME | Bangor | N1AHH | |
| MI | Ann Arbor | AD8Y | |
| MI | Brighton | WA1LRL | (VHF/14.107 GW) |
| MI | Detroit | N8BMA | (145/220 GW) |
| MI | Fraser | K8NLD | |
| MI | Grand Rapids | N8BVX | |
| MI | Grand Rapids | WA8URE | |
| MI | Holland | KJ8C-1 | |
| MI | Southfield | W8KOX | |
| MN | Rochester | WDOHEB | |
| MN | Woodbury | WBOGDB | |
| MS | Gulfport | WA5DVV | (145.01/14.107 GW) |
| MS | Gulfport | WA5DVV-1 | (145.01/145.09 GW) |
| NE | Fremont | WBOQIY | |
| NE | Hastings | WBOHRG | (VHF/14.107 GW) |
| NE | McCook | KOTAJ | |
| NE | Souix City | NFON | |
| NH | E. Kingston | WB1DSW | (145.01/14.103 GW) |
| NH | Goffstown | WB2JCU-1 | |
| NH | Marlow | WA1FHB | |
| NH | Salem | KA1MGO-1 | |
| NH | Windham | W1PW | |
| NJ | Atco | KC2TN | (HF/VHF GW) |
| NJ | Atco | K3GYS | |
| NJ | Eatontown | NN2Z-1 | |
| NJ | Indian Mills | KA2BQE | (145.07/220 GW) |
| NJ | Medford | WB2MNF | |
| NJ | Pennsauken | WB2RVX | |
| NJ | Plainsboro | KB1BD | (145.07/220 GW) |
| NJ | Readington | WB2GWD | |
| NJ | Union | WB2ZDH | |
| NJ | Wayne | WA2SNA-1 | (145.01/220 GW) |
| NJ | Wyckoff | KD6TH-1 | (145.07/220 GW) |
| NM | Albuquerque | KA5BEM-1 | |
| NM | Albuquerque | KN5D | (145.01/14.107 GW) |
| NM | Albuquerque | K8BI-1 | (145.01/14.107 GW) |
| NY | Churchville | N2EOP | |
| NY | Elba | KA2VTY | |
| NY | Farmingville | W2JUP-4 | (145.07/220 GW) |
| NY | Freeport | AI2Q | (145.07/220 GW) |
| NY | Hyde Park | WA2RKN-2 | |
| NY | Montauk | K2AAA-4 | (145.07/221.11 GW) |
| NY | S. Glens Falls | N2AYY-1 | (145.01/145.05 GW) |
| NY | Skaneateles | KC3BQ | |
| OH | Cincinatti | K4ZLE | |
| OH | Circleville | AD8I | (VHF/HF GW) |
| OH | Cleveland | KB8CI | (VHF/14.107 GW) |
| OH | Enon | WB9ANQ | |
| OH | Fairfield | KC8TW | |
| OH | Gahanna | WB8WGA | |
| OH | Poland | WB8LVP | (VHF/14.103 GW) |
| OK | Lake Keystone | WB5MPU | (145.01/14.107 GW) |
| ON | Borden | VE3NPZ | |
| ON | London | VE3GYQ | (VHF/14.107 GW) |
| ON | Milton | VE3KOI | |
| ON | Orillia | VE3FJB-1 | |
| ON | Ottawa | VE3FXI | |
| PA | East Bangor | KB3UD | |
| PA | Harrisburg | KC3BN | |
| PA | Harrisburg | WB3EYB | |
| PA | Hummelstown | AK3P | |
| PA | New Derry | WB3AFL | |
| PA | Pittsburgh | K3MC | |
| PA | Red Hill | N3ACL | |
| PA | Roslyn | K3PGB | |
| PA | Royersford | N3CHX | |
| PA | Washington | W3CYO | |
| PA | Wilkes Barre | K3RLI | |
| RI | Cranston | N1DKF | (145.01/221.11 GW) |
| SC | Florence | WA4SZK | (HF/VHF GW) |
| TN | Johnson City | WX4S | |
| TN | Knoxville | K4EID | (145.01/14.107 GW) |
| TN | Powell | KC4OI | (145.01/147.48 GW) |
| TN | Sweat Mtn. | KD4NC | |
| TX | Garland | WA5MWD | |
| TX | Gause | W5XO | (VHF/14.107 GW) |
| TX | Houston | WA4EWV | (VHF/14.107 GW) |
| TX | Houston | WB5BBW | |
| TX | Houston | WB5JLI | |
| TX | Houston | WD5DEH | |
| TX | San Antonio | W5ERO | (VHF/14.107 GW) |
| UT | Logan | WA7MBL | |
| VA | Centreville | N4GVA | |
| VA | Charlottesville | WD4TFZ-2 | |
| VA | Chesterfield | WD4BAV | |
| VA | Hampton | N4XG | |
| VA | Martinsville | WB4YJC | |
| VA | Woodbridge | K4NGC | (145.01/145.05 GW) |
| VA | Woodbridge | WD4SKQ | |
| VT | Milton | KD1R-1 | |
| WA | Enumclaw | WB7DCH | (HF/VHF GW) |
| WI | Cedarburg | WD9DHI | (145.09/7.093 GW) |
| WI | Green Bay | AG9V | |
| WI | Milwaukee | WA9POV | |
| WI | N. Prairie | WA9KEC | |
| WI | Rhinelander | W9ZBD | (145.01/7.093 GW) |
| WV | Harpers Ferry | N8FJB | |

| | | | |
|---|---|---|---|
| Grand Cayman Island | | ZF1GC | |
| Norway | Oslo | LA6TBA | |
| Norway | Skien | LA6OCA | (145.300/14.105 GW) |
| Norway | Skien | LA6OCA-1 | (145.300/433.650 GW) |
| Sweden | Karlstad | SM4KCJ | |
| W Germany | Langenfeld | DL1WX | |

{thanks to WORLI for compiling the source
- W2JUP, 7/18/86 - Edited by K4NTA 8/17/86}

- PRM-

## /MM2 HF PACKET TEST

M.G. Briscoe, W1IAY
Woods Hole Oceanographic Institute
Woods Hole, MA 02543

During 4-27 October I will participate in a multi-ship research study of ocean mixing physics. The site is in the eastern North Pacific near 34 N, 127 W. The HF packet radio tests are not part of this research except for making use of one of the ships (USNS Desteiguer) and my spare time.

HF packet radio might someday be a good way to transmit data from buoys at sea to laboratories ashore. It is not yet used in any commercial bands, but maritime mobile usage would be likely in the 3.5 kHz ocean data telemetry allocations in the 4,6,8,12,16, and 22 MHz bands.

The purpose of this HF packet radio test is to obtain a data set that can be used to verify a model of data throughput during a typical maritime mobile application. Although the HF link rate is 300 baud, the actual data throughput is lower than 300 baud due to the time required for error-checking, forwarding, acknowledgements, and retries. Variable propagation (no path open to a receiving station) also slows down the data transfer. How much data can you get ashore from a buoy at sea, especially if you don't care WHERE it goes ashore?

The transceiver will be a Kenwood TS-430S to a Hygain 14AVQ/WBS. The TNC and terminal are a Kantronics KPC-2 and Silent 700 Model 743.

Expectations for the best time of day for operations on 14 MHz for the given site (8 hours ahead of UTC) and month are:

| | | |
|---|---|---|
| Site --->> | U.S. East Coast | 1400-0100 UTC |
| | U.S. West Coast | 1600-0300 |
| | Hawaii | 1700-0700 |
| | Alaska | 1600-0400 |
| | Japan | 2000-0600 |
| | England | 1500-1900 |

Between approximately 1700-0100 UTC, excluding 2000-2100 UTC, I will try to maintain the HF packet radio in a ready state for connections as requested by participating shore stations. Outside these core operating times the operations may be continued, depending on propagation and my availability.

My call sign will be W1IAY on the packet system; my designation as W1IAY/MM2 will be given in the actual messages transmitted. I will be physically present and in control during all transmissions. The tests will be run as a propagation and throughput experiment, and no "useful" telemetry will be passed.

The frequency monitored will be "14105" kHz. My system will beacon at 5 minute intervals with a short message indicating its availability.

Shore stations should connect with my station at their convenience; they will receive a connect message indicating the status of the tests. If I am not busy with other activities in the lab I will participate in two-way exchanges with the shore station.

The data collected will consist of the printout on the ship of each connection; the time and calling station will be logged. If the ship (simulated "buoy") had actually had data to transmit it would have been able to at that time.

Each participating shore station should maintain a log of times that connections were attempted with my maritime mobile station; this is important in analysis afterwards of the efficiency of the links.

The participating stations should send me a copy of their log of attempted and successful contacts. I will send them a special QSL (and a big thank you!). I anticipate trying to model the results using MINIMUF, estimating what the data throughput might have been, and working out the apparent gain from having used spatial receiving diversity; if all goes well, an article describing the experiment will be written for one of the ham magazines, and will list all the participants.

- PRM -

## USING OLDER RADIOS ON PACKET

Glen Leinweber, VE3DNL

I'd like to tell everyone not to discount that old two meter radio sitting at the bottom of your closet as unsuitable for packet radio. My Heathkit HW-202 is a crystal-controlled, relay-switched, solid-state radio of 1973 vintage that, at first thought, was too "old-fashioned" for modern packet communication.

It turns out that it is the fastest gun in the area where send-receive switching delays are concerned! Even with relay switching, the transmitter comes up to full power 17 milliseconds afer my modem asserts the PTT line. Many solid-state-switched radios can take 50 to 100 milliseconds; phase-locked-loop settling time of their frequency synthesizer is the likely cause for longer delays.

I pick the Rx audio off from the receiver at a point before the squelch switch, so that the squelch delay doesn't cut into received packets. The HW-202, even though phase modulated, is compatible with H.A.P.N.'s 4800 baud modem. So now this rig is at the top of the closet, with my T.N.C., instead of at the bottom; when the relay clicking gets the better of me, I close my closet door.

- PRM -

*PPRS - continued from page 5.*

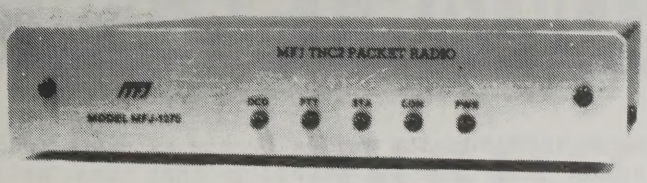
The PPRS December meeting will be our annual "hardware night." Bring your rig and show us your fancy software. We try to have at least one of every type of TNC in operation that evening. Anybody still have a working VADCG board? Who will bring a new PK232?

PPRS mail can be directed to AJ6T @ N6IIU-1 (that is my home BBS), via Compuserve (76625,476) or via USPS (POB 51562, Palo Alto, Ca. 94303). PPRS meetings are held the first Tuesday of each month at 7:30 pm at the Ampex cafeteria (411 Broadway, Redwood City). Visitors are always welcome.

- PRM -

# AFFORDABLE PACKET RADIO FROM MFJ

**MFJ's TAPR TNC 2 clone in a new cabinet with added features...for an incredible $139.95!**



**MFJ-1270**
**$139.95**

**Join the exciting packet radio revolution and enjoy error-free communication...for an incredible $139.95! MFJ brings together** efficient manufacturing and TAPR's (Tucson Amateur Packet Radio) leading edge technology to bring you top quality and affordable packet radio.

**You get MFJ's highly acclaimed clone** of the industry standard TAPR TNC 2. Its in a new cabinet and includes a TTL serial port and an easily replaceable lithium battery for memory back-up.

**All you need is** your rig, home computer with a RS-232 serial port and a terminal program. If you have a Commodore 64, 128, or VIC-20 you can use MFJ's optional Starter Pack to get on the air immediately.

You get interfacing cable, terminal software on tape or disk and complete instructions...everything you need to get on packet radio. Order MFJ-1282 (disk) or MFJ-1283 (tape), $19.95 each.

**Unlike machine specific TNC's** you never have to worry about your MFJ-1270 becoming obsolete because you change computers or because packet radio standards change. You can use **any** computer with an RS-232 serial port and an appropriate terminal program. If packet radio standards change, software updates will be made available as TAPR releases them.

**Also speeds in excess of 56K bauds are possible** with a suitable external modem! Try that with a machine specific TNC or one without hardware HDLC as higher speeds come into widespred use.

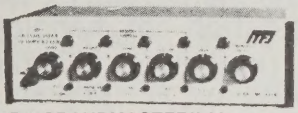
**You can also** use the MFJ-1270 as an excellent but inexpensive digipeater. You can use 12 VDC for portable operation or 110 VAC for fixed station operation.

**It features** AX.25 Level 2 Version 2 software, hardware HDLC for full duplex, true Data Carrier Detect for HF, 16K RAM, simple operation plus more.

**Help make history!** Join the packet radio revolution now and help spread this exciting network throughout the world. Order the top quality and affordable MFJ-1270 today.

## Here are MFJ's latest and hottest products for improving your station's performance.

### MEMORY KEYER
**MFJ-484B**
**$139.95**



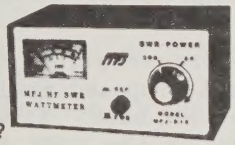
**The MFJ-484B "GRANDMASTER"** Memory Keyer is **THE** choice of CW contesters. Why? Because it's so easy to use it's second nature...you don't have to remember how to use complex commands...**and** it has all the features you'll ever need for easy CW.

**Features like these...** you can store up to twelve 25 character messages that you can combine and send at whatever speed you want, you can repeat any message continuously or pause between repeats, you can change or insert into a playing message by simply sending and much more.

**The MFJ-484B is RF proof,** sends 8-50 WPM and measures just 8x2x6 inches. It uses 12 to 15 VDC or 110 VAC with MFJ-1312, $9.95.

### HF SWR/WATTMETER

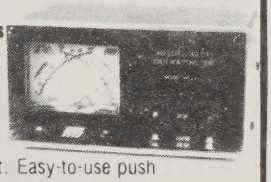
**MFJ-816**
**$29.95**



**Want minimum SWR to maximize your antenna performance?**

**The MFJ-816 is our smallest** -4½x2¼x3 inches-(and most affordable) SWR/Wattmeter that lets you read SWR, forward and reflected power (30/300 watt scales) from 1.8 to 30 MHz. Uses toroidal current pickup for uniform sensitivity.

### CROSS-NEEDLE SWR/WATT METER
**MFJ-815 $59.95**



**MFJ's cross-needle SWR/Wattmeter gives you SWR, forward and reflected power —all at a single glance!** SWR is automatically computed —no controls to adjust. Easy-to-use push buttons select three power ranges that give you QRP to full legal limit power readings. Reads 20/200/2000 W forward, 5/50/500 W reflected and 1:1 to 1:5 SWR on easy-to-read two color scale. Lighted meter. Needs 12 V. ±10% full scale accuracy. 6½ x 3¼ x 4½ inches.

### 2 KW COAX SWITCHES

**MFJ-1702**
**$19.95**

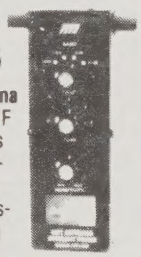
**$29.95 MFJ-1701**

**Instantly select any antenna or rig by turning a knob.** Organizes coax cables and eliminates plugging and unplugging. Unused terminals are grounded to protect your equipment for stray RF, static and lightning. 2 KW PEP, 1 KW CW. For 50 to 75 ohm. Negligible loss, SWR, and crosstalk gives high performance. SO-239s. Convenient desk or wall mounting.

**MFJ-1702, $19.95. 2 positions.** Cast aluminum cavity construction gives excellent performance up to 500 MHz with better than 60 dB isolation at 450 MHz. Heavy duty, low loss switch has less than 20 milliohm contact resistance, less than 0.2 dB loss and SWR below 1:1.2. 2 x 2½ x 1 inches.

**MFJ-1701, $29.95. 6 positions.** White markable surface for recording ant. positions. 8½ x 1½ x 3 in.

### ANTENNA CURRENT PROBE
**MFJ-206 $79.95**



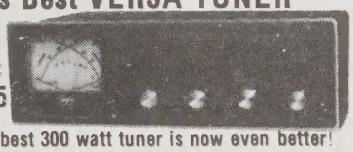
**This new breakthru MFJ Antenna Current Probe** lets you monitor RF antenna currents—no connections needed! Determine current distribution, RF radiation pattern and polarization of antennas, transmission lines, ground leads, building wiring, guy wires and enclosures.

- **Indicate transmission line radiation** due to high SWR, poor shielding or antenna unbalance.
- **Detect re-radiation** from rain gutters and guy wires that can distort antenna field patterns.
- **Detect RF radiation** from ground leads, power cords or building wiring that can cause RFI
- **Determine if ground** system is effective.
- **Pinpoint RF leakage** in shielded enclosures.
- **Locate the best place** for your mobile antenna
- **Use** as tuned field strenght meter.

**Monitors RF current** by sensing magnetic field. Uses an electrostatically shielded ferrite core, FET RF amplifier, op-amp meter circuit for excellent sensitivity, selectivity. 1.8-30 MHz. Has sensitivity, bandswitch, tune controls, telescoping antenna for field strenght meter. 4 x 2 x 2 inches.

### MFJ's Best VERSA TUNER

**MFJ-949C**
**$149.95**



**MFJ's best 300 watt tuner is now even better!**

**The MFJ-949C all-in-one Deluxe Versa Tuner II** gives you a tuner, cross-needle SWR/Wattmeter, dummy load, antenna switch and balun in a new compact cabinet. You get quality conveniences and a clutter-free shack at a super price.

**A new cross-needle SWR/Wattmeter** gives you SWR, forward and reflected power—all at a single glance. SWR is automatically computed with no controls to set. Has 30 and 300 watt scale.

**Run up to 300 watts** RF output—and match coax, balanced lines or random wires from 1.8 thru 30 MHz. Tune out SWR on dipoles, vees, long wires, verticals, whips, beams/quads. 10x3x7 in.

### RF PRESELECTOR

**MFJ-1040**
**$99.95**

**Is your transceiver or receiver "hearing" all it could?** Adding a MFJ-1040 RF preselector can make "lost" signals readable while reducing troublesome images and out-of-band signals. It adds 20 dB of low noise gain with a strong, sharp tuning front end and covers all HF amateur and shortwave bands through lower VHF from 1.8 to 54 MHz.

**A built-in 20 dB attenuator** prevents receiver overload. It has automatic bypass for transmitting, works with 2 antennas and 2 receivers, is 8x2x6 inches and uses 9-18 VDC or 110 VAC with optional MFJ-1312, $9.95

### MOBILE ANTENNA MATCHER

**MFJ-910 $19.95**

**Lower your SWR and Get more power into your mobile whip** for solid signals and more QSOs. Your solid state rig puts out more power and generates less heat. For 10-80 meter whips. Easy plug-in installation. Complete instructions. Fits anywhere, 2½x2½in.

**ORDER ANY PRODUCT FROM MFJ AND TRY IT-NO OBLIGATION. IF NOT SATISFIED, RETURN WITHIN 30 DAYS FOR PROMPT REFUND (less shipping).**
• One year **unconditional** guarantee • Made in USA
• Add $5.00 each shipping/handling • Call or write for free catalog, over 100 products.

**MFJ**

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## *FCC LEGALIZES VHF/UHF PACKET MESSAGING SYSTEMS*

A news bulletin courtesy of Tom Clark, W3IWI

Bob, KY3R (a DC area packeteer and practicing communications attorney) has provided the following interesting information of concern to all packeteers. As many of you remember, the NPRM RM-4879 and the associated Report and Order 85-105 effectively shut down VHF/UHF packet radio messaging by requiring a control operator to be present whenever 3rd party traffic was being handled. The FCC interpretation of what constitutes 3rd party traffic included any messages where an intermediary (like a BBS) relayed anything between two other parties -- the three parties being the originator, the recipient and the BBS.

ARRL and TAPR plus many individuals filed reply comments on the absurdity of this situation, and the ARRL succeeced in obtainining 'Extraordinary Relief' in the form of a temporary waiver of the new 85-105 rules pending reconsideration by the FCC (thus preserving the status quo). Now the FCC has made their decision that we are legal -- and we no longer operate under the tenuous blanket of the waiver! Not that this decision in no way affects the HF packet situation and the limbo status there continues.

THE FCC TODAY (OCTOBER 9) ISSUED THE FOLLOWING PRESS RELEASE, PUTTING TO FINAL REST, AT LEAST INSOFAR AS PACKET AT VHF AND UP IS CONCERNED, THE DOCKET 85-105 CONTROVERSY. THE FULL TEXT OF THE FCC ACTION IS NOT YET AVAILABLE.

REPORT NO. DC-645
ACTION IN DOCKET CASE (PR DOCKET 85-105)
OCTOBER 9, 1986

FCC AUTHORIZES AUTOMATIC CONTROL FOR CERTAIN AMATEUR STATIONS WHEN RETRANSMITTING THIRD-PARTY TRAFFIC

THE FCC HAS AMENDED PART 97 PERMITTING NETWORK INTERMEDIATE AMATEUR STATIONS, TRANSMITTING DIGITAL COMMUNICATIONS ON VHF AND ABOVE, USING THE AMATEUR RADIO RELAY LEAGUE, INC. (ARRL) AX.25 PACKET PROTOCOL, TO BE OPERATED UNDER AUTOMATIC CONTROL WHILE TRANSMITTING THIRD-PARTY TRAFFIC.

PACKET IS A SECIALIZED FORM OF DIGITAL COMMUNICATIONS, RELATIVELY NEW TO AMATEUR RADIO, CONSISTING OF NUMEROUS AMATEUR STATIONS USING PERSONAL COMPUTERS AND ASSOCIATED CIRCUITRY RETRANSMITTING MESSAGES FROM ORIGINATING STATIONS TO DESTINATION STATIONS.

ALTHOUGH IT ACKNOWLEDGED ASSURANCES OF SAFEGUARDS BY THE ARRL FOR THE AX.25 PROTOCOL, THE FCC NOTED THAT CONTROL OPERATORS CAPABLE OF MONITORING SUCH TRANSMISSIONS MUST ALERT THE CONTROL OPERATOR OF ANY INTERMEDIATE RETRANSMITTING STATION, UNDER AUTOMATIC CONTROL, OF ANY STATION MISUSE SO THAT CORRECTIVE ACTION CAN BE TAKEN.

THE COMMISSION DEFERRED ACTION ON REQUESTS FOR AUTOMATIC CONTROL FOR DIGITAL COMMUNICATIONS ON FREQUENCIES BELOW VHF UNTIL ITS FEASIBILITY CAN BE DETERMINED.

ACTION BY THE COMMISSION OCTOBER 6, 1986, BY MEMORANDUM OPINION AND ORDER (FCC 86-427). COMMISSIONERS FOWLER (CHARIMAN), QUELLO, DAWSON, AND PATRICK, WITH COMMISSIONER DENNIS NOT PARTICIPATING.

- PRM -

## ALA-NET > PACKET

THE NEWSLETTER OF THE
ALABAMA PACKET RADIO ASSOCIATION
Jim Griffith, WA5RAX

**HSV-MEETING:** The following are excerpts from the August 17th ALA-NET meeting that was held at Huntsville, Alabama. WD4CPF, Leigh, ALA-NET Director-at-Large opened the meeting and served as coordinator of the activities. Reports from each of the LANs were as follows:

**Central LAN** - Henry, K4HAL, reported that the Central LAN has moved to 145.67. W4KDP-3, K4HAL-2, and ANN are also on 145.67. The WA5RAX PBBS has ports on 145.67 and 145.01 with gateway access enabled. Future plans are to two-port K4HAL-1 on 145.01 and 440.

**Northern LAN** - Leigh, WD4CPF, reported the Huntsville PBBS (WB4ZKX-1) has changed its designation to HSVBBS and has moved to the 145.65 LAN frequency.

**Capitol LAN** - Wayne, AA4BL, provided information on the status of the Capitol LAN. He reported that Bob, N4HY, had moved. We will miss Bob and his efforts to aid in packet in our area which were monumental to say the least. A new digi has been installed as W4AP-2 with an alias of MGY. The link between MGY and WB4FSK-1 is fair.

**Southern LAN** - Mike, WB4JHU, provided a report on their happenings. The Mobile LAN is on 145.01. NN4Y is being two-ported on 145.01/440. East and West links into Mississippi are reported to be good. He also reported that NN4Y is establishing a BBS running on a Model 100.

Following these presentations, the 440 frequency was discussed. AA4BL proposed moving down into the link segment of the 440 band. It was agreed to try the 443.4 frequency on the WDBB tall tower forst before looking at another frequency. W4CNQ volunteered to contact CVRA regarding frequency coordination between states.

Step-by-step instructions for turning a TAPR-2 clone into a tow-port system are being documented by N4KTY.

- PRM -

*PPRS HINT OF THE MONTH:* If you have anything to send to a BBS, use your word processor to create a text file off-line before you log into the mailbox. Then upload your message to the BBS, rather than tying up the frequency as you create a message letter-by-letter at the keyboard while connected to the box. Always try to minimize your connect time to a BBS.

- PRM -

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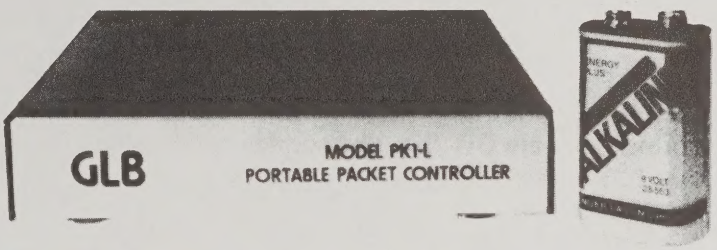


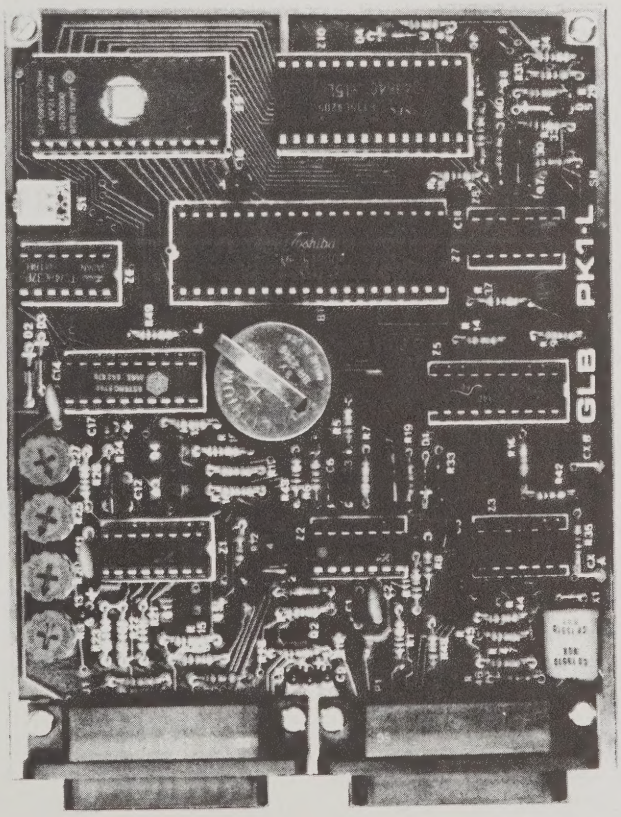


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The idea behind the Pakratt is very simple. One controller that does Morse, Baudot, ASCII, AMTOR, and Packet, and works both HF and VHF bands. Of course the decoding, protocol, and signal processing software must be included in the unit, and connection to the computer and transceiver have to be easy. The unit also has to be small and require only 12 volts, so it will work both in the shack and on the road.

### Second, Computer Compatible

It doesn't matter what kind of computer you have, we have a Pakratt for you. The PK-64 works with the popular Commodore 64 or 128, and the PK-232 works with any other computer or terminal that has an RS-232 serial port. The PK-64 doesn't require any additional programs. Simply connect to the computer and transceiver and you're on the air. The PK-232 needs a terminal or modem program for your computer. The one you're using with your telephone modem will work just fine.

## PAKRATT™ Model PK-64

## PAKRATT™ Model PK-232

### Third, Performance and Features

The real measure of any data controller is what kind of on-air performance it gives. While the PK-64 and PK-232 use different types of modems, both give excellent performance on VHF. The optional HF modem of the PK-64 uses independent four-pole Chebyshev filters for both Mark and Space tones, and A.M. detection. The HF option can be factory or field installed.

The PK-232 uses an eight-pole bandpass filter followed by a limiter discriminator with automatic threshold correction. The internal modem automatically selects the filter parameters, CW Fc = 800 Hz, BW = 200 Hz; HF Fc = 2210 Hz, BW = 450 Hz; VHF Fc = 1700 Hz, BW = 2600 Hz.

The PK-64 uses on screen indicators to show status, mode, and DCD (Data Carrier Detect) while the PK-232 uses front panel indicators. Both units use discriminator style tuning for HF operation. And that's just the tip of the iceberg. Features like multiple connects on packet, hardware HDLC, CW speed tracking, and other standard AEA software features are included in both the PK-64 and PK-232.

### Fourth, AEA Quality and Price

Not many manufacturers like to discuss quality and price at the same time. AEA thinks you want high quality and low price in any product you buy, so that's what you get with the Pakratts. Ask any friend who owns AEA gear about our quality. The people who buy our products are our best salespeople. As for price, the PK-64 costs $219.95, or $319.95 with the HF option. The PK-64A, an enhanced software unit with a longer flexible computer cable, costs $269.95 or $369.95 with the HF option. The PK-232 costs $319.95 with the HF modem included. All prices are Amateur Net and available from your favorite amateur radio dealer. For more information contact your local dealer or AEA.

Prices and specifications subject to change without notice or obligation.

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